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In THE MUNICIPAL INDEX AND ATLAS (the annual reference volume of data and condensed catalogs published by the American City Magazine Corporation) readers will find statistical material, and articles on a wide variety of municipal and public works subjects, not published in the monthly issues of the magazine.

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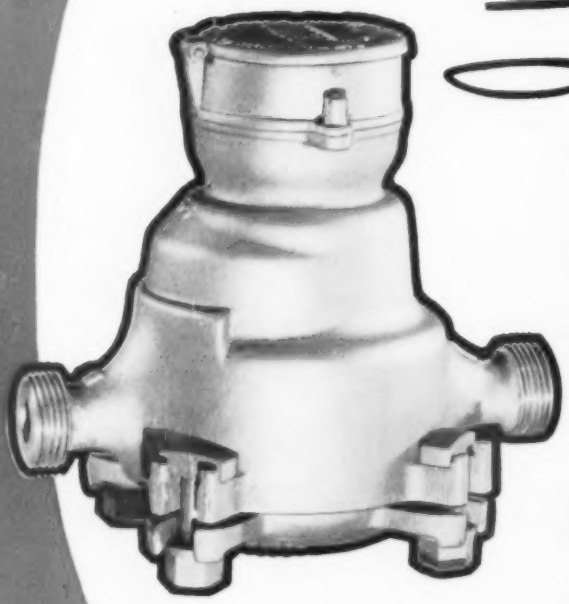
AGAIN *and* AGAIN -A GAIN



The largest single water meter order placed in the United States in 1934 was for

PITTSBURGH METERS

1,883 new accounts in the last 3 years

—An appreciation of value

PITTSBURGH EQUITABLE METER CO.

MERCO NORDSTROM VALVE CO.

MAIN OFFICES PITTSBURGH, PA.

New York Columbia Chicago Memphis Kansas City Philadelphia Tulsa Houston Los Angeles Oakland

$4,880,000,000 for "Purposes" and "Projects"

Broad Powers to the President

UNDER the terms of what is to be known as the "Emergency Relief Appropriation Act of of 1935," which passed the House of Representatives on January 24 (H. J. Res. 117), and was introduced in the Senate on January 25, there may be appropriated by Congress by the time this issue of THE AMERICAN CITY reaches its readers, the substantial sum of $4,880,000,000. The joint resolution as adopted by the House provides:

"That in order to protect and to promote the general welfare, by (1) providing relief from the hardships attributable to widespread unemployment and conditions resulting therefrom, (2) relieving economic maladjustments, (3) alleviating distress, and/or (4) improving living and working conditions," the sum designated shall be immediately available and remain available until June 30, 1937, "to be used in the discretion and under the direction of the President in such manner, and for such purposes and/or such projects, Federal or non-Federal, as shall be adapted to the accomplishment of any one or more of the objectives specified in clause (1), (2), (3), or (4)."

In carrying out the provisions of the act (if not amended before passing the Senate), the President will have the power:

"(a) To guarantee loans to, or payments of, needy individuals;

"(b) To make grants and/or loans and/or contracts; and

"(c) To acquire, by purchase or by the power of eminent domain, any real property or any interest therein, and improve, develop, maintain, grant, sell, lease (with or without the privilege of purchasing), or otherwise dispose of any such property or interest therein."

It appears, therefore, that most of the handicaps to the speedy allocation of funds for a wide variety of public purposes which existed in the National Industrial Recovery Act of 1933, will have been removed. The new phraseology, indeed, is broad enough to cover all the planning, housing, public works and public improvement projects and equipment whose inclusion in the new legislation was advocated by THE AMERICAN CITY in its December front cover editorial.

Moreover, the joint resolution in the form in which it passed the House, as above quoted, gives the President full power to use any or all of the $4,880,000,000 for outright grants, thus removing the restriction which limited grants for local projects to 30 per cent grants of the cost of labor and materials.

Has Your City Reported Its Needed Projects?

PROMPT action is important for any city which has not already furnished to its PWA State Engineer, for transmission to Washington, a list of projects which might be considered for a share of the $4,880,000,000 which seems likely soon to be made available for allotment by the President under the Emergency Relief Appropriation Act of 1935.

Prior to the introduction of this new legislation in Congress last month, a national inventory of available works projects was started by the Public Works Administration and the National Resources Board. To aid in securing local data for use in this survey, questionnaires containing the typewritten schedule here reproduced were sent to all PWA State Engineers, who have been instructed to make the survey in conjunction with State Planning Boards and State Planning Consultants assigned by the National Resources Board.

Projects are to be listed in the order of their relative importance according to needs and benefits. The following questions are to be answered:

Total estimate cost, including purchase of land, if any?
Will project be revenue-producing?
Proposed method of financing?
Does project conform with regional, county or city plan?
Will project compete with any existing facility?
Will project complete work already started?
Are construction plans and/or specifications ready?
How soon after date can work be started?
Give time required to complete project.

According to instructions given PWA State Engineers, the schedules are to be returned to State Engineers prior to February 11, for forwarding to Washington prior to March 1.

TYPES OF PROJECTS WHICH MUNICIPALITIES ARE ASKED TO SUBMIT

Utilities:
- Water Supply Systems
  - Complete new systems
  - Extension of mains
  - Reservoirs
  - Filtration plants
  - Miscellaneous improvements (describe)
- Sewer Systems
  - Sanitary sewers (new systems)
  - Sanitary sewers (extensions)
  - Storm sewers
  - Combined systems
  - Disposal plants
  - Miscellaneous improvements (describe)
- Garbage and rubbish disposal plants
- Gas plants
  - Complete systems
  - Distribution systems
- Electric Power Systems
  - Hydro-electric generating plants
  - Mine-Mouth generating plants
  - Other generating plants
  - High tension transmission lines
  - Urban distribution systems
  - Rural distribution systems
  - Street lighting systems
- Street Railway and Rapid Transit Improvement
- Miscellaneous Utilities (describe)

Streets, Highways and Bridges
- New road and street construction
- Resurfacing and repairing of roads and streets
- Sidewalks, curbs and gutters
- Bridges (steel, concrete, etc.)
- Culverts and drainage
- Lights, signals, etc.
- Grade crossing separation
- Roadsides
- Miscellaneous (describe)

Buildings, New and Repair Work:
- City Halls
- Court Houses
- Fire and Police Stations
- Auditoriums
- Schools (type)
- Libraries
- Dormitories
- Lecture Halls, Laboratories
- College Administration Buildings
- Other educational buildings
- Hospitals
  - Publicly owned and operated
  - Privately owned and operated for public benefit
- Homes for aged, orphans, etc.
- Penal Institutions
- Markets
- Warehouses
- Slum Clearance and Housing Projects
- Other Structures (describe)

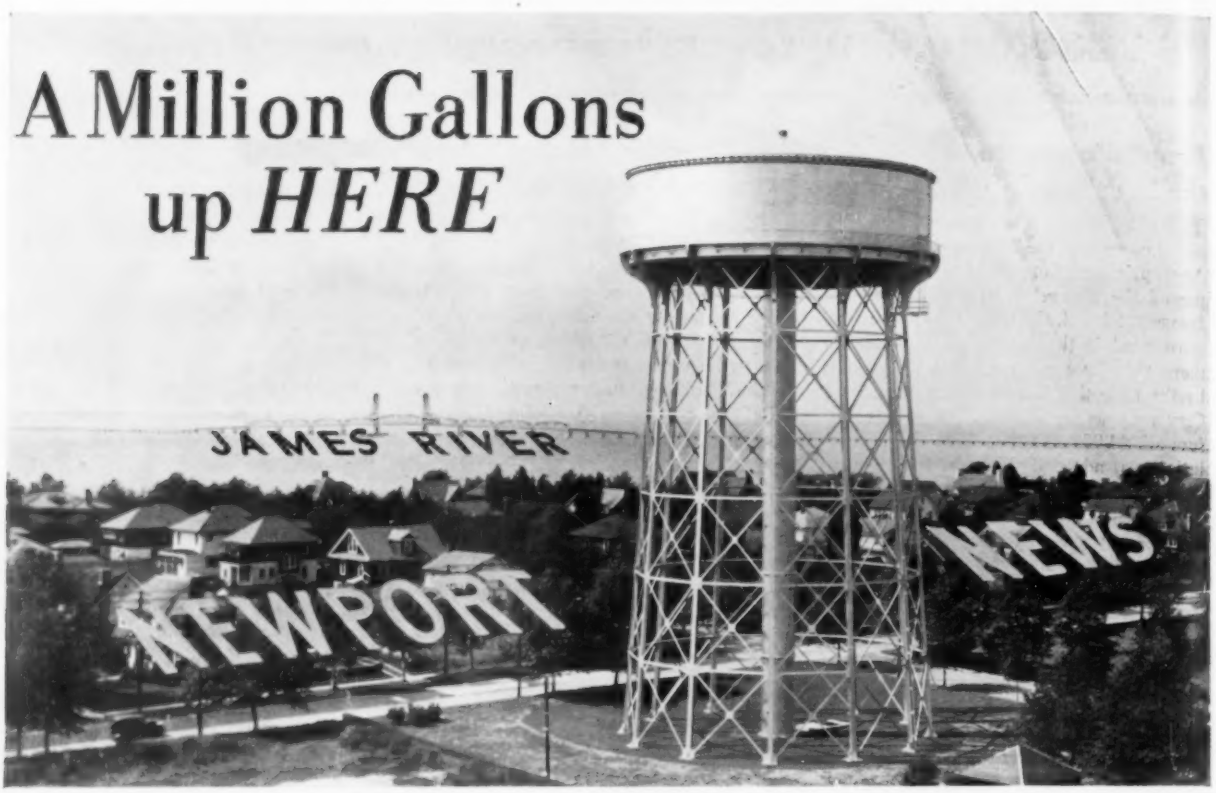
Recreational Facilities:
- Swimming Pools
- Gymnasiums and Athletic Facilities, including Stadiums
- Recreational buildings, including Community Centers
- Park improvements (describe)
- Athletic fields and playgrounds and tennis courts
- Golf Courses
- Camp sites

Shipping and Terminal Facilities:
- River improvements (describe)
- Harbor improvements (describe)
- Canals
- Docks and Wharves
- Grain Elevators
- Railroad Terminal Facilities
- Airports
- Other (describe)

Miscellaneous:
- Irrigation systems
- Drainage projects
- Flood protection and control
- Reforestation
- Soil erosion control
- Fish hatcheries

Comprehensive Planning Surveys and Studies.

A Million Gallons up *HERE*



—Helps Save $12,000 annually
AT NEWPORT NEWS

A million gallons of water seems small alongside the tremendous volume in a flowing stream such as the James River. It is small compared to the 2¼ billion gallons in impounded reservoirs from which the Newport News Waterworks Commission draws its supply. It is smaller than the adjacent ground-level storage reservoir of 3½ million gallons capacity.

But the addition of this one million gallons of ELEVATED storage made possible a more uniform pumping rate and chemical feed rate, so that the change-over to more efficient pumping units makes a total annual saving of approximately $12,000, or about $1.00 per year for each service connection.

The advantages of adequate elevated storage have been demonstrated time and time again in cities of all sizes. Countless cities have installed elevated tanks ranging from 25,000 gallons to 4,000,000 gallons capacity—some using three or four or five separate tanks—all with the same results, improved service and reduced operating costs.

We shall be glad to discuss the advantages of elevated storage with municipal officials and engineers and to supply estimating data on installations.

Recent Radial Cone Tank Installations

BROOKLYN, N. Y. *1,250,000 Gals.*
SANDUSKY, O. *1,000,000 Gals.*
INDIANAPOLIS, IND. *1,500,000 Gals.*
COLUMBUS, O. *2,000,000 Gals.*
EVANSTON, ILL. *1,500,000 Gals.*
NEWPORT NEWS, VA. *1,000,000 Gals.*
THOMASVILLE, N. C. *1,000,000 Gals.*
ROCKY MOUNT, N. C. *1,000,000 Gals.*

CHICAGO BRIDGE & IRON WORKS

Chicago.....2127 Old Colony Bldg.
New York.....3308-165 Broadway Bldg.
Cleveland.....2236 Rockefeller Bldg.
Detroit.....1501 Lafayette Bldg.
Philadelphia..1616 "1700" Walnut Street Bldg.
Boston.....1501 Consolidated Gas Bldg.
Birmingham.....1502 N. Fiftieth Street
Dallas.....1406 Dallas Athletic Club Bldg.
San Francisco.....1033 Rialto Bldg.
Houston.....2919 Main Street
Tulsa.....1625 Thompson Bldg.
Los Angeles.....1403 Wm. Fox Bldg.

Fabricating plants in CHICAGO, BIRMINGHAM, and GREENVILLE, PA.

Filtration, Stand-By Charges, Red Water

Filters at the New Springwells Plant, Detroit

THE group of sixty-eight filters are adjacent to and centering on the south wall, which is the outlet end, of the settling basins of the new Springwells filtration plant at Detroit. The filters are arranged in four rows along two parallel pipe galleries, with concrete influent conduits connected by cross-conduits to the outlet chambers of the settling basins. The top slab of the influent conduits forms the operating floor between the rows of filters.

The filters are of the front gullet type, with longitudinal wash troughs of cast iron and perforated cast iron pipe underdrains. The underdrain laterals are connected to a central manifold cast in the concrete bottom of the filter. The ends of the laterals at the side walls of the filter unit are connected by 4-inch cast iron headers parallel to the walls to eliminate dead ends and to assure more uniform distribution of flow in the underdrain system. These wall headers are perforated also to give a slight excess of wash water along the filter walls, during washing.

The filtering medium consists of an 18-inch depth of specially selected gravel and 20 inches of silica sand. The gravel grades in size from 3 inches, maximum diameter at the bottom, to 1/16-inch particles at the top of the gravel layer. The sand is 95 per cent pure silica having an effective size of 0.5-mm and a uniformity coefficient of 1.3; 2 per cent of it is composed of particles larger than 1 mm. The sand finer than 0.3-mm was washed out and is disregarded in computing the effective size and uniformity coefficient.

While it is filtering, water normally stands within 6 inches of the top of the filter walls, making about 7 feet of water depth on the surface of the sand bed. In washing, the sand expands 50 per cent and rises to the bottom of the lower ends of the wash troughs.

All header conduits are of concrete and are arranged to form the floor of the pipe gallery as well as the filter operating floor above. The filter connections are made with cast-iron fittings and flanged valves of the following sizes: influent, 36 inches; effluent, 24 inches; wash water, 24 inches; sewer, 30 inches; re-wash, 8 inches.

All valves are of the cast-iron, bronze-mounted, double-disk type, actuated by hydraulic cylinders operated from a marble-faced operating table or cabinet located on the filter operating floor at the front of each filter. All hydraulic cylinders are bronze-lined throughout, including the cylinder heads and pistons, and all pressure piping to the valve cylinders is of seamless copper tubing.

Each filter is equipped with a rate-of-flow controller of the venturi type and a loss-of-head gage, both actuating and indicating and recording gage head mounted on the filter operating table above. The rate controllers are arranged for master-control setting or for individual setting as desired. The pipe galleries are heated by steam radiators and ventilated by a line of steel grating along each side of the operating floor.

The wash-water supply system consists of two pumps with capacities of 6,000 gallons per minute each, two pumps with capacities of 8,000 gallons per minute, located in recesses off one pipe gallery, and two 50,000-gallon tanks in the cross-monitors of the filter building. The pumping capacity is sufficient for washing filters continuously, one at a time, and the tank capacity is sufficient for one single-filter wash. The depth of the wash-water tank and the rate of filter washing are indicated on a large illuminated gage near the center of each operating gallery.

—From a paper by EUGENE A. HARDIN, Assistant Engineer-Designer, Black & Veatch, Kansas City, Mo., formerly Designing Engineer, Department of Water Supply, Detroit, Mich., published in the Proceedings of the American Society Civil Engineers, November, 1934.

What Is Your Policy?

Do you make a stand-by charge to vacant property where there is no service connection already installed?

Do you cover this by a front-foot assessment, or a standard charge?

What do you think of the idea, and is it legal in your state, and permitted by your city charter?

Let's hear from you!

Preventing Red Water and Corrosion

AS iron is slightly soluble in water, it is probably safe to say that all public water supplies would carry some of it in solution, and be unsatisfactory for domestic consumption, if the water were not prevented from coming in direct contact with the iron of the distribution pipes. The higher the acidity of the water, or the lower the pH value, the higher will be the amount of iron dissolved. Water with a pH of 9.0, for instance, dissolves only traces of iron, whereas water with a pH of 6.0 or 6.5 dissolves appreciable quantities.

Red water troubles in a distribution system can be prevented by adjusting the chemical balance of the water. Water may be treated so that an impervious film will be deposited on iron surfaces with which it comes in contact. In this manner iron surfaces may be protected against the dissolving action of water. Water that is supersaturated with calcium carbonate will quickly deposit a coating or film on the inside of the pipe. Water that is almost saturated—and this applies to numerous natural supplies—will also deposit a protective coating, because in the process of corrosion carbon dioxide is taken from the water. The solubility of calcium carbonate in natural water depends on the carbon dioxide content; therefore, if some of the carbon dioxide is absorbed, the nearly saturated water becomes saturated, or perhaps supersaturated. When this point is reached, deposition of calcium carbonate starts and the corroding iron becomes coated with a protective film of calcium carbonate. Water that is undersaturated with calcium carbonate will dissolve calcium carbonate film already formed.

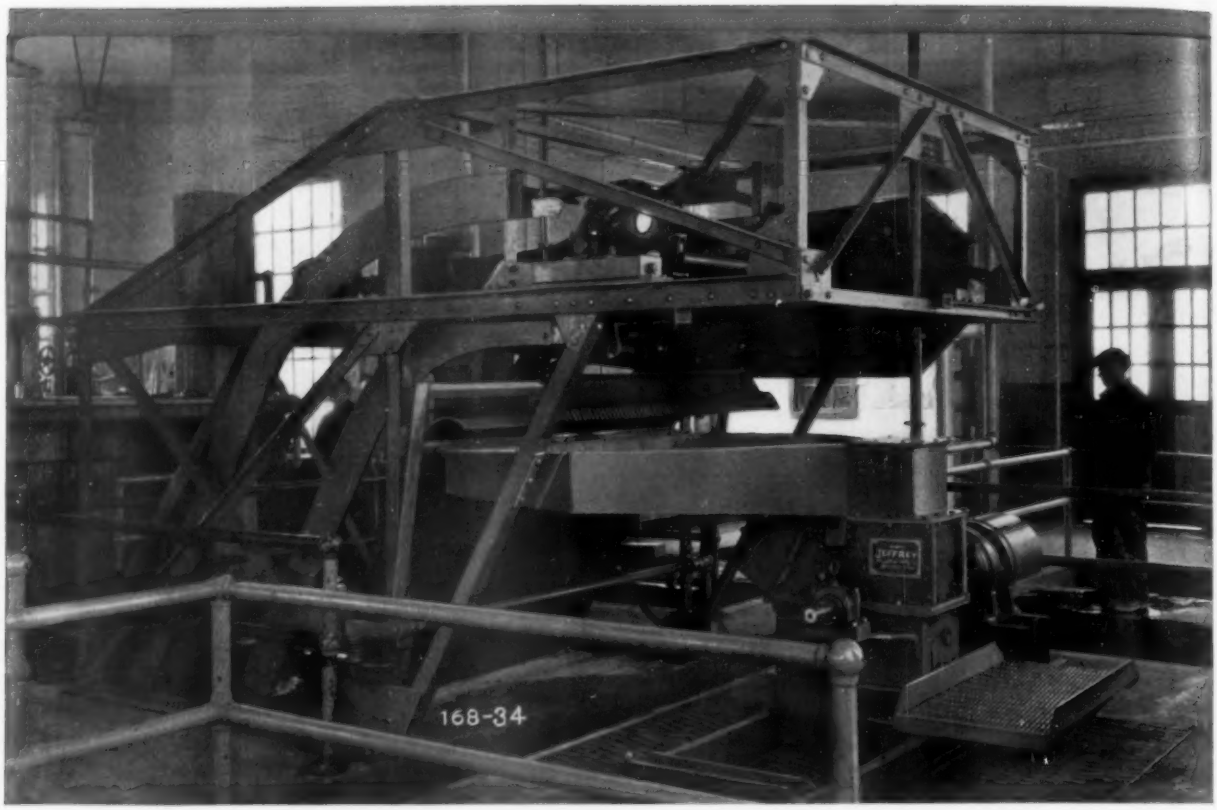
In using the chemical balance process to build up a protective coating, care must be taken not to continue the building-up process too long, because pipes will become clogged. This has happened in many municipalities having lime-soda softening plants. The water produced was supersaturated, which resulted in too much deposit in the pipe lines, meters and heating coils, and necessitated finding corrective measures. A practical corrective treatment process has been perfected, and the trouble has now been entirely overcome by the process of recarbonation; that is, by adding carbon dioxide gas to the water. Protective films built up by calcium carbonate will not last long if the water brought in contact with them is undersaturated.

If the analysis shows that the calcium carbonate content of the water is less than 25 to 30 parts per million, or undersaturated, then if is necessary, if corrosion is to be prevented, to build up the calcium carbonate content. This can be accomplished by adding lime to the water, or if the water already contains some calcium sulphate, soda ash can be added and the results will be satisfactory. Soda ash reacts with calcium sulphate to form calcium carbonate. It may be convenient to build up the calcium carbonate by adding some hard water.

After the calcium carbonate content is known, the next step is to build up the pH value, if necessary, by the use of soda ash. Experience in working with soft water has shown that if enough soda ash is added to give the water a distinct deep color with phenolphthalein as an indicator, satisfactory results will usually be obtained. After the calcium carbonate and pH adjustments have been made, it is easy to determine whether or not the water is saturated, supersaturated or undersaturated, by making a calcium carbonate chemical balance test.

The tests are so easily and so quickly made that any operator should be able to determine without difficulty whether or not the water produced at his plant is in chemical balance.

—Printed by permission from "Water Supply and Treatment," by CHARLES P. HOOVER, Water Softening and Purification Works, Columbus, Ohio, published as copyrighted Bulletin 211 by the National Lime Association, Washington, D. C.



JEFFREY Screen and Grinder

The Only Positive Method of Sewage Screening Disposal

Illustration shows a recent installation of a Jeffrey-Self-cleaning Bar Screen (Patent pending) and a Jeffrey Screenings Grinder.

The improved Jeffrey mechanically-cleaned Screen embodies safety features not found in other screens and is the result of many years of development.

You can forget screening troubles with this new type Screen . . . a special hinged scraper prevents jamming of the mechanism from the accumulation of foreign objects such as bricks, water-soaked logs, etc.

The rake teeth on this screen pass entirely through the screen, cleaning not only the surface but the spaces between the bars . . . preventing grease accumulation.

Screenings are conveyed by the automatic rake to the screenings hopper. A limit switch stops the rake after they have been dumped. When the hopper is full, the Jeffrey Grinder is started and the screenings raked into the machine, the pulverized material dropping back into the sewage, then to the settling tanks.

The Jeffrey Grinder actually reduces the screenings to a pulp (it does not tear it into long strings or strips that will eventually clog the pumps) which passes readily through the pumps and sinks into the settling tanks. Where the sludge is filtered, the addition of the pulped screenings materially increases the efficiency of the filters.

The particular installation shown here is handling an average flow of 16 to 20 million gallons per day.

A Jeffrey Sanitary Engineer is at your disposal . . . he will be glad to look over your plant and submit recommendations . . . without obligation.

Complete data covering Jeffrey Screens and Grinders as well as other types of Jeffrey Sewage Disposal Equipment sent on request.

The Jeffrey Manufacturing Company

970-99 North Fourth Street, Columbus, Ohio

New York Rochester, N. Y. Pittsburgh Boston Cleveland Chicago Milwaukee Salt Lake City Dallas
Buffalo Philadelphia Scranton, Pa. Cincinnati Detroit Huntington, W. Va. Denver Birmingham

Jeffrey Manufacturing Company, Ltd., of Canada. Head Office and Works, Montreal. Branch Offices, Toronto—Calgary—Vancouver.

Sewerage and Sewage Disposal

Odor Control of Sewage by Prechlorination Proved Effective

DURING the past 20 months, the writer of this paper had the opportunity of conducting an experiment in odor control by prechlorination. In the town where this experiment was carried on, the sewage plant, consisting of an Imhoff tank and trickling filter, is located very near the residential district. The water supply for this community is taken from one of the deepest wells in Iowa and is exceptionally high in sulphates. The sewage disposal problem is also materially affected by the discharge of creamery wastes. Soon after the plant was put into operation numerous complaints were made concerning obnoxious odors. After a preliminary investigation, it was decided that prechlorination was desirable. Subsequently a Wallace & Tiernan dry feed chlorinator was set up to apply chlorine at the entrance of the Imhoff tank. This point of application was not strictly satisfactory in view of the flat grades on which the collection system is laid, but was the best that could be obtained under the circumstances.

Before chlorination, the liquid in the Imhoff tank settling compartment and in the dosing tank was of a dense black color and had the typical stale odor of septic sewage. A laboratory test of the raw sewage coming into the plant indicated a sulphate content of 483 ppm and a temperature of 16 degrees C. These conditions, coupled with the long detention period afforded by the settling tanks, undoubtedly were responsible for the hydrogen sulphide odors. The chlorinator was set for a dosage of 12 parts per million, with the intention of cleaning up existing conditions and reducing the dosage after a few days of operation.

During the course of this experiment it was found that the obnoxious odors arising from this plant could be materially reduced by prechlorination, even though conditions for economical treatment were not at all ideal. In the first place, the sewage had become septic to some extent before reaching the plant and before the chlorine could be applied. Furthermore, the mixing of chlorine with the sewage was inadequate owing to the fact that a dry feed machine was in service and proper distribution could not be obtained. The chlorine dosage was varied between 8 and 18 ppm, depending upon local weather conditions, particularly in regard to the direction of wind currents. The maintenance of a slight chlorine residual in the tank effluent was attempted, but because of wide fluctuations in flow the dosage was more than enough for hydrogen sulphide reduction at certain times, as indicated by a chlorinous odor coming off the liquid as it was dosed on the trickling beds.

After a few days of continuous chlorination the settling tank effluent had lost its black color and appeared to be in a fresh condition. Furthermore, the turbidity of the effluent had increased, which would indicate the precipitation of flocculent sulphur and the subsequent reduction in hydrogen sulphide.

Because of the lack of time which could be devoted to this experiment, no determinations of hydrogen sulphide concentration were made at the plant. The results of the experiment were judged entirely on decisions of the local people previously affected. The plant operator reported a remarkable reduction in hydrogen sulphide odors in the immediate locality of the plant, and town officials reported a substantial decrease in complaints. It cannot be said that all objectionable odors were eliminated by this process, but it is believed that the odor nuisance was decidedly reduced.

—From a paper presented by P. J. Houser, Assistant Engineer, Public Health Engineering Division, State Department of Health, Iowa, at the fifteenth annual Iowa Sewage Treatment Conference.

Inflammable Wastes Should Not Be Discharged into Sewer Systems

A FIRE believed to have been caused by the ignition of gasoline wastes occurred recently at the municipal sewage treatment plant in Middletown, N. Y. The damage was confined principally to the interior of one building. A fire of similar origin took place at the plant shortly after it was put into operation in 1930.

The sewage treatment works, constructed at a cost of about $200,000, consist of coarse bar screens (2½-inch openings), grit chamber and bar screens (1-inch openings), chlorination equipment, settling tanks, separate sludge digestion tanks and sludge drying beds. The grit chamber and fine bar screens are mechanically cleaned and housed in a brick building which also contains the chlorine supply in 1-ton containers and equipment for its application, a laboratory in a separate part of the building, and a basement containing gas utilization equipment, lime-feeding equipment, sludge pumps, and coal- and gas-fired boilers. The sludge drying beds are partly of the open type and partly glass-covered.

The operator first noticed the fire in the coarse bar screen chamber as the sewage entered the plant. The flames followed the sewage into the building, appearing first in the grit chamber and then at the screen chamber. Owing to the intense heat, the ton cylinder of chlorine developed a dangerously high pressure. It was cooled by the application of a stream of water directly on the container. The fire was extinguished in about an hour with Foamite by the City Fire Department. In the meantime the sewage was bypassed around the plant.

Fortunately, there was no serious damage to the equipment. The paint on the interior of the building was badly scorched, however, and window panes were broken.

This experience, which might have ended disastrously, emphasizes the importance of preventing the discharge of inflammable wastes into sewer systems and the desirability of the adoption and enforcement of suitable local ordinances to regulate such conditions.

—From *Health News*, issued weekly by the New York State Department of Health.

A SEWAGE PUMPING STATION AS SEEN BY THE PASSERBY IN DETROIT, MICH.

PILES POURED AT ZERO
Driven in 3 Days

Precast piles were used for a viaduct carrying Erie Railroad over principal streets in Elmira, N. Y. Even in zero weather, piles made with 'Incor' 24-Hour Cement were driven in hard soil when only 3 days old, enabling contractor to start pouring pier foundations two months earlier, giving work to 150 more men that much sooner. Contractor saved at least 10% on overhead; railroad and public profited through earlier use of structure.

After casting, piles were covered with heavy tarpaper, ends and sides protected with burlap and straw, the whole overlaid with tarpaulins and steam-cured 48 hours. Short curing period and earlier stripping enabled contractor to use half the forms required with ordinary cement. Stock was reduced from 1500 piles to 75.

A new book on "Winter Construction" is ready; it contains practical information on all types of Winter work. Address 'Incor' 24-Hour Cement, Room 2200, 342 Madison Ave., New York. 'Incor'* is made and sold by producers of Lone Star Cement, subsidiaries of International Cement Corporation, New York; also sold by other leading cement manufacturers.

*Reg. U. S. Pat. Off.

'INCOR' 24-Hour Cement

Streets, Highways and Traffic Paint

Federal Road Building Exceeds All Past Records

THE road construction supervised by the Bureau of Public Roads in the fiscal year ending June 30, 1934, far exceeded the construction in any previous year, according to the Annual Report of Thomas H. MacDonald, Chief, U. S. Bureau of Public Roads.

"This increase was due primarily to grants for road construction under the National Industrial Recovery Act," says the report. "The roads built have been sections of the Federal-aid highway system, extensions of the system into and through cities, important secondary or feeder roads, and sections of main highway through the national forests, parks and public lands."

The peak in employment, with 336,414 at work on Federal and Federal-aid highway construction, came in June, 1934, when the new public works program was well advanced. This figure represents direct employment on the roads only and does not include the indirect employment, conservatively estimated at 1.4 times the direct, provided in the production and transportation of materials and equipment used in road construction.

Cost of Building Stabilized Roads

THE cost of building a 1½-inch compacted stabilized mat using calcium chloride on 1,400 square yards of surface in the city of Wilmar, Minn., is given in the following table. The 1½-inch thickness was used because the mat was constructed over a firm base and it was desired to elevate the street slightly and obtain a smooth riding surface.

60 cu. yds. gravel @ 90c per yard	$ 54.00
Screening and delivering gravel at 20c per cu. yd. (½-mile haul)	12.00
Clay—20 cu. yds. @ 5c per cu. yd.	1.00
Delivering clay @ 45c per cu. yd.	9.00
Mixing, spreading and compacting	18.00
Calcium chloride, 2,520 pounds	36.00
	$130.00

On another project the costs of the stabilized surface were as follows:

12,300 sq. yds. surface	
125 cu. yds. gravel delivered @ 83c per cu. yd.	$104.00
130 cu. yds. clay delivered @ 50c per cu. yd.	65.00
Mixing and spreading	20.00
Calcium chloride applied (9 tons)	300.00
	$489.00

There were 375 cubic yards of gravel on the surface incorporated in the final mixture in this second project, and these quantities made a 1.6-inch compacted mat.

The cost of construction of this type of road can vary greatly, depending on the thickness of the mat built, the cost of materials, etc. Many engineers are beginning to base the cost of stabilizing on the additional material necessary to add to the aggregate to bring about stabilization, plus the cost of additional operations necessary and, of course, the cost of the calcium chloride. For instance, on a secondary road which requires a placement of 200 cubic yards of aggregate or gravel per mile of 20-foot road per year owing to loss as dust and floats, etc., engineers have found that the cost of stabilizing and maintaining with calcium chloride is less than that of the aggregate replacement, and at the same time a well-bonded, hard, smooth and dustless road is secured.

R. W. MILLER.

U. S. to Panama Highway 40 Per Cent Complete

THE 3,200-mile highway connecting the southern boundary of the United States with the Panama Canal zone and transversing Mexico and Central America is approximately 40 per cent complete and open to year-round traffic, with an additional 27 per cent in good condition in dry weather. The termini of the Inter-American highway are Nuevo Laredo in Mexico, just across the Rio Grande from Laredo, Texas, and Panama City, Republic of Panama. Between them, the completed road will stretch about 3,250 miles, amid the contrasts of thriving cities and tranquil native villages, of volcanic peaks and tropical jungles. While the report, Senate Document No. 224, 73d Congress, prepared by the U. S. Bureau of Public Roads, describes the highway as "proposed," it is in fact already well on the way to realization. To establish connections between the sections of road already built, and to modernize existing highways where necessary, is the task confronting the five Central American republics, Panama, and Mexico.

Estimates of cost to complete the road through Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, and Panama, are made on three types of construction: (1) 18-foot surface of local materials, approximately $30,000,000; (2) same surface, but with oil treatment, $38,000,000; (3) 20-foot cement concrete surface, $101,000,000. The completion of the Mexican section to the Guatemala border would add 80 per cent, 67 per cent, and 58 per cent, respectively, to these estimates, assuming the sections already improved in Mexico would be used without change in type.

The proposed route will touch every capital from Mexico City to Panama save one, Tegucigalpa, Honduras—which will be reached by a spur line. Of the estimated 6,000,000 population of the Central American republics and Panama, 54 per cent is in provinces traversed by the route, and 28 per cent in contiguous provinces. The line follows roughly the Continental Divide at elevations usually ranging from 1,500 to 4,000 feet.

The report on "The Proposed Inter-American Highway" is in quarto size, 162 pages of text, containing economic and technical prefaces, and sections descriptive of the countries traversed, a wealth of statistical data, and many plan and profile maps and illustrations. It may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 70 cents a copy.

Black Center Stripe Paint

THE State Highway Department of South Carolina started experiments in 1930 to find an improved and cheaper black paint for center stripes on concrete highways. Several commercial paints and also cut-back asphalt were used and their performance observed on the pavements. After two years it was found that excellent results were obtained at low cost by using the regular cut-back asphalt which is used on retreatment work. It is necessary to cut it back further with 25 to 30 per cent gasoline. Sand is sprinkled over the freshly applied paint, which eliminates tracking by traffic and prevents slipperiness due to the stripe. The specifications for the cut-back asphalt paint are as follows:

The asphalt base shall be straight run product, homogeneous, free from moisture, and shall conform to the following requirements:

(1) Penetration at 25° C. (177° F.) 100 gms. 5 sec. 85 to 100
(2) Flash point (open cup)—Not less than 175° C. (347° F.)
(3) Loss on heating at 163° C. (325° F.), 50 gms. 5 hrs—Not more than 2%
(4) Penetration at 25° C. (77° F.) 100 gms. 5 sec. of residue after heating at 163° C. (325° F.) as compared with penetration of asphalt cement before heating—Not less than 60%
(5) Ductility at 25° C. (77° F.)—Not less than 100 cms.
(6) Proportion of bitumen soluble in CCl_4 Not less than 99%

The cut-back (flux) shall consist exclusively of a petroleum product and shall conform to the following distillation requirements. Test to be made by A.S.T.M. Method D-86-30.

Total distillate to 93° C. (200° F.)—Not more than 4%
Total distillate to 149° C. (300° F.)—30 to 45%
Total distillate to 200° C. (392° F.)—90 to 98%
The end point shall not exceed 210° C. (410° F.)

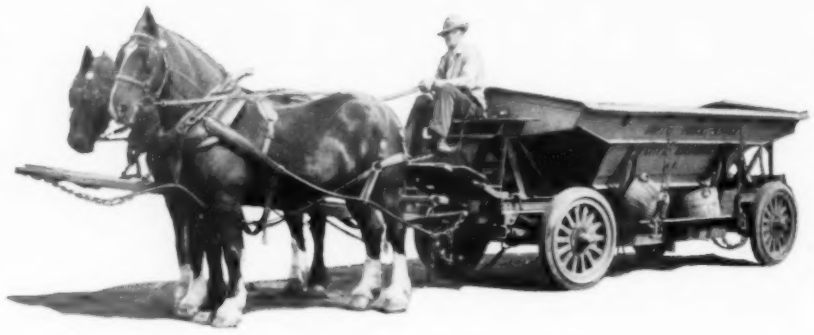
The finished product shall be made wholly from the above specified asphalt base and cut-back (flux), so proportioned and mixed with due care to avoid evaporation of the more volatile constituents, that the finished product shall be homogeneous and conform to the following requirements:

Viscosity at 50° C. (122° F.)—140 to 180 (Furol)

—From an unpublished report of the State Highway Department of South Carolina, April 17, 1934.

MAINTENANCE
Asphalt, Brick, Concrete
See Section 3 of the
1934-35 Municipal Index.

It won't be long now—



before the last open garbage wagon has passed into the realm of forgotten things. The day of the COVERED WAGON is here!

Covered wagons of various types, one after another, have been appearing on the market for years. But it has remained for the Marion Steel Body Company to manufacture one that effects **substantial savings in garbage collection costs.** The MARION truck body is compression type. A simple device compresses the load, squeezing out the fluid content into a 110-gallon container located beneath the body. This means, of course, greatly reduced collection expense because of the greatly increased carrying capacity of the truck body.

The MARION Refuse Compressor may be mounted on any 1½, 2 or 2½-ton truck. Its total load—6 cubic yards, compressed—is the equivalent of 12 to 15 cubic yards of loose refuse.

Summing it all up briefly:

Bigger loads—fewer trips.
Fewer trips—less expense.
Less expense—greater satisfaction.

That is the final result of "BEING MODERN WITH MARION."

Write for Circular

Manufactured Exclusively by

The Marion Steel Body Company, Marion, Ohio

Patents applied for.

Street Cleaning, Snow Removal, Refuse Disposal

Take Pride in Your City

THE Manchester Corporation Cleansing Committee, Manchester, England, has at various times carried on publicity campaigns to reduce the litter in the city streets. A 12-page booklet used in one of the recent campaigns has come to the attention of THE AMERICAN CITY and from it the following paragraphs are quoted:

"If ever you have had occasion to travel along the main roads of Manchester shortly after midnight or in the early hours of the morning you are almost sure to have seen the Corporation sweeping machines and teams of street scavengers brushing the streets clean and carting away the rubbish which has accumulated on the surface during the daytime.

"This is the Cleansing Department at work.

"All through the night throughout the year these workmen (800 of them)—swillers, sweepers, ruckers, gridmen, fillers, carters—all following each other in orderly succession, with water sprinklers, sweeping machines, and scavenging carts, may be found busily making the dirty streets of Manchester clean again and once more presentable in appearance for the coming day.

"Alas, do you realize how soon is so much of their work undone?

"Look for yourself. Take notice of the condition of the streets and roads at eight o'clock in the morning when the Cleansing Department has completed its night's task. Everywhere is spick and span—a credit to the city.

"But look again in the afternoon. What a change has taken place! The streets have become as untidy as ever!

"Some of the dirt and refuse you see is, of course, the result of the busy traffic, and cannot be avoided.

"But how much of the general untidiness and disfigurement of the streets is the fault of the citizens themselves?

"And all because of a little want of thought and a lack of proper civic pride.

"What do you see? Empty paper bags, pieces of newspaper, all sorts of ugly-looking litter thrown carelessly down.

"And all of it preventable if we would but take a little thought."

The booklet, which was distributed to school children, concludes with the request:

WILL YOU TRY AND HELP?

When you have carefully read this booklet will you please hand it to your parents or guardians and ask them to read it. Thank you.

Removing the Refuse of World's Fair Visitors

IN the two summer seasons that the recent Century of Progress Exposition was open in Chicago, 24,764 trailer loads of rubbish, 15,969 loads of garbage, and 2,456 tons of waste paper were removed from the Fair grounds. After each day's closing this clean-up took place. Industrial trailers were spotted throughout the grounds during the daytime and then made up into trains when the closing hour came, and hauled to the disposal site. According to reports, the amount of rubbish removed in any one day depended on two factors—the attendance and the buoyancy of the spirit of the crowd.

Snow-Plows Have Right-of-Way in Minnesota

THE Minnesota State Highway Department recently issued a notice through the newspapers appealing to motorists to exercise unusual caution when meeting snow-plows at work on through highways. It says: "Drivers will save themselves much inconvenience and some danger if they will make it a habit to slow down or stop when they meet a plow. They should pull as far to the side of the road as possible and give the snow-plow the right-of-way. In order to throw snow from the highways and keep them open for public use, it is necessary for the big V-plows to travel 25 to 30 miles an hour and maintain a steady pace. They cannot dodge, jump or stop for every approaching car if they are to do an effective job.

"Many pleasure-car drivers will approach a plow without slackening speed, expecting the plow to get out of their way. When it does not, they try to turn out at the last moment, but are going so fast they run into the ditch. If these drivers would slow down and turn out for the plow, they would seldom have any difficulty. Snow-plows carry brilliant blue lights for night warning."

Street-Cleaning Activities in St. Louis

THE duties of the Street Cleaning Section of the Department of Streets and Sewers, St. Louis, include the cleaning of all streets and alleys as well as the removal of snow in winter. This work is done by motor flushers, motor sweepers and hand labor. The expenditures in this Section have been unusually high in the past, but a reduction has been accomplished in recent years by the use of equipment in place of expensive hand labor and in spite of a decided increase in the mileage of streets and alleys cleaned.

The contractor who cleaned the streets with vacuum cleaner trucks received an average of $90,469.61 in the five fiscal years, 1928-29, to 1932-33, and in the latter fiscal year used three vacuum sweepers to clean 82,466 great squares (of 1,000 square yards each). Taking into account the width of the machine used, there is an equivalent of 16,170 gutter-miles, which gives an approximate cost of $3.50 per mile. The purchase price of two new motor-driven sweepers, which were purchased for city operation to supplant the contractor, was $12,480.75. The operating and maintenance costs for one year on these two sweepers was $19,691.51 and they covered 13,400 miles.

Careful observation showed that these sweepers did a much more thorough job than the vacuum equipment used by the contractor. Assuming that interest charges would be offset by no inclusion of salvage value at the end of six years, the average cost per gutter-mile including depreciation with the motor-operated sweepers would be $1.68, showing a very substantial saving over contract operation. Bearing in mind that this comparison is with the previous fiscal year on a charge of 67 cents per great square, whereas the other years were based on a charge of 79 cents per great square, a comparison with the higher price per great square would show a still further saving.

The squeegees formerly used for street cleaning have been entirely eliminated as well as surplus trucks and surplus hand labor, all of which has tended toward greater efficiency and reduced costs.

FRANK J. MCDEVITT,
Director of Streets and Sewers.

Cleaning and Flushing Streets in Los Angeles

THE area which might be described as the heart of the city of Los Angeles is divided into two sweeping districts with 113 hand sweepers, and 11.14 miles in the industrial section are swept at night by mechanical sweepers. There are eight mechanical sweepers, which cover 100 routes, averaging 24.38 curb miles to a route, 1219.35 street miles being machine-swept.

In the downtown districts, seven trucks are employed on the pick-up. Sweepers work from 8 A. M. to 5 P. M. except in highly congested territories, which are patrolled between 5 and 6 A. M. Each district foreman of maintenance is allotted a number of hand sweepers and a 3-ton pick-up truck.

The outlying districts are machine-swept as follows: on residential streets, once weekly; on semi-business and arterial streets, twice weekly, supplemented by hand sweeping where necessary. Sweepings are dumped at assigned locations for pick-up.

The power flushers work from 1:30 A. M. to 7:00 A. M. The business district is flushed on alternate nights. More important traffic arteries are flushed twice a week and others once a week. Outlying pavements are flushed when necessary. Flushers are used also for wetting grades and for like purposes in connection with construction work. Eleven power flushers are operated in the city proper, and one in the Harbor District. There are 2,027 miles of paved streets in the city.

LLOYD ALDRICH,
City Engineer.

GAMEWELL Offers a Complete Line of RADIO EQUIPMENT

for POLICE and FIRE DEPARTMENT Service

Police Radio Transmitter Type "CQ"

Gamewell, as exclusive Westinghouse distributor, is in a position to furnish radio transmitting equipment for municipal, county or state fire and police departments. Gamewell is the one company in the field that can take care of your police radio problem completely and without divided responsibility: 1. ***survey***, 2. ***sale***, 3. ***installation***, and 4. ***service***.

Three transmitters, models "CQ," "EB" and "EG," are available. They were designed specifically for police and fire department work and are built exclusively for us by Westinghouse, pioneers in radio broadcasting.

Type "CQ" Police Radio Transmitter

This model is designed for local and network use in cities, counties, etc., where the population is 100,000 or more. It has a power rating of from 100 to 500 watts as allowed by the Federal Communications Commission, and will take care of municipal, county and state police requirements. The "CQ" model is sometimes used as a headquarters transmitter in a two-way radio system. It is an attractive, highly efficient and easily maintained unit.

Type "EB" Police Radio Transmitter

Designed exclusively for local police radio service in cities of 100,000 or less. Has power rating of 50-watts and is of the ***same unit*** type construction as the larger "CQ" model. Provides all the features of the larger transmitters for the smaller city. The "EB" is also attractive and of highly efficient construction designed for easy maintenance.

Type "EG" Police Radio Transmitter

The "EG" model is an ultra-high-frequency transmitter used as a headquarters unit for an ***ultra-high-frequency*** two-way police system. It is of the same appearance and type of construction as the "EB" model.

Police Car and Precinct Receiving Equipment

Receiving equipment for police car and precinct stations can be supplied for both conventional and ultra-high-frequency bands. More complete literature and information will be provided on both transmitting and receiving equipment for police and fire department service upon request.

Police Radio Transmitter Types "EB" and "EG"

THE GAMEWELL COMPANY, NEWTON, MASS.

Exclusive Distributors in the United States of

GAMEWELL-WESTINGHOUSE POLICE RADIO

Public Safety

Place 10-20-Year Fire Apparatus on Reserve—It's Worth It

A FIRE is an emergency. A conflagration is the grimmest emergency that can confront a city. Consequently, normal fire service is the maximum of fire service that a city or a town can afford to provide in relation to its fireman-power. The purpose of having reserve equipment is that when all the men are needed they shall all have tools to use.

The big item of expense in a fire department is the payroll. The best way to justify this expense is to assure effective work at the proper time. Reserve equipment has the value not only of furnishing extra equipment in time of need, but of providing the necessary minimum equipment during periods of overhauling and in the event of accidents. The usual ratio is one piece on reserve to eight pieces in service.

Most of the larger cities more than maintain this ratio, as the accompanying tabulation shows. Baltimore, in fact, has almost as much in reserve as in service.

In the smaller of these cities a few trained men plus the larger number of citizens who will aid, provide a personnel capable of efficient work if adequately equipped.

Half the cities in the table have no ladder trucks in reserve. Consequently, with one of these trucks out of commission (usually a matter of months when this happens) there will be a material increase in life hazard in the community.

Motor fire apparatus began to be purchased in quantity in 1913, and buying was brisk during the next five years. The records show that much of this equipment is still in service. Therefore, a fair percentage of fire equipment now in use is 15 to 20 years old.

In the opinion of many it is good for quite a few years yet, especially in view of some of the home-made apparatus that is appearing. This 15-20-year-old apparatus is good reserve equipment. It has been kept in repair; in its whole life it has not done more work than a commercial truck with 20,000 miles; *but*—parts are hard to get; it has not four-wheel brakes. Better put it in reserve and buy new apparatus than have the brakes changed. Apparatus prices are much lower than they used to be. Either a 500-gallon pump or a 750-gallon (still better) can be bought at a reasonable figure.

But where's the money to buy it coming from? Why not on bond issues? Fire equipment is durable and qualifies for this class of purchase. Not only is equipment purchased 20 years ago still in service, but the equipment being purchased today is of much better quality and design than these 20-year-olds.

Fire apparatus of a community, like its street lighting and traffic signs, helps strike the keynote of the community. It advertises as well as protects the town.

Which sounds the more prosperous?

Jersey City has bought some second-hand trucks and tractors and built two hook and ladder trucks, two salvage trucks and one high-pressure truck, "at very small cost and in our opinion equal to any we could buy." Elizabeth, a few miles distant geographically, has retired its faithful 65-foot aerial, and on November 5, purchased the 75-foot ladder truck shown on this page, price $17,000.

Not to aid industrial recovery, though it will do it, but for the safety and advertisement of your town: *A country-wide campaign to purchase one piece for each eight now in service and place the oldest equipment in reserve.*

ENGINES AND LADDERS IN 36 CITIES
NATIONAL BOARD OF FIRE UNDERWRITERS FIGURES

City	Date of Report	Number of Engines: In Service	Reserve	Needed	Number Ladders: In Service	Reserve
Birmingham, Ala.	June, 1932	22	1	3	4	0
Phoenix, Ariz.	April, 1934	7	0	1	1	0
Long Beach, Calif.	Jan., 1934	11	1	2	1	1
San Francisco, Calif	July, 1932	47	11	5	15	4
Atlanta, Ga.	Nov., 1933	19	3	3	10	0
Savannah, Ga.	Jan., 1934	8	2	1	3	0
Fort Wayne, Ind.	Aug., 1934	10	0	2	3	0
Gary, Ind.	May, 1932	7	0	1	3	0
Indianapolis, Ind.	May, 1932	31	3	4	16	2
Lexington, Ky.	Mar., 1932	7	1	1	2	0
New Orleans, La.	May, 1932	41	7	5	11	1
Baltimore, Md.	Oct., 1932	53	41	7	25	6
Fall River, Mass.	May, 1932	9	0	1	5	0
Salem, Mass.	May, 1934	4	0	1	2	0
Grand Rapids, Mich.	Mar., 1933	12	3	2	6	1
Muskegon, Mich.	Aug., 1932	6	1	1	1	0
Omaha, Nebr.	April, 1934	19	1	2	8	2
Atlantic City, N. J.	May, 1933	11	0	2	6	1
Hoboken, N. J.	Mar., 1933	5	1	1	3	1
Newark, N. J.	Jan., 1933	32	4	4	12	2
Buffalo, N. Y.	Feb., 1933	35	5	4	14	2
New York, N. Y.	Dec., 1933	236	38	25	126	26
Winston-Salem, N. C.	July, 1934	6	1	1	1	0
Cincinnati, Ohio	May, 1933	36	2	4	14	3
Allentown, Pa.	Sept., 1934	8	0	1	2	0
Altoona, Pa.	Nov., 1933	6	0	1	3	0
Sioux Falls, S. D.	Feb., 1932	3	1	1	3	0
Memphis, Tenn.	May, 1933	19	2	3	6	0
Chattanooga, Tenn.	April, 1932	14	0	2	3	0
Beaumont, Texas	July, 1932	5	1	1	2	0
Fort Worth, Texas	May, 1932	15	1	2	7	0
San Antonio, Texas	June, 1932	15	3	2	3	2
Norfolk, Va.	Dec., 1932	18	1	3	7	0
Richmond, Va.	Mar., 1934	17	5	3	6	1
Yakima, Wash.	Feb., 1933	3	1	1	1	0
Wheeling, W. Va.	July, 1932	12	1	2	4	0
Kenosha, Wis.	May, 1931	5	0	1	2	0
Oshkosh, Wis.	Nov., 1932	6	0	1	2	1

Next month's article starts:

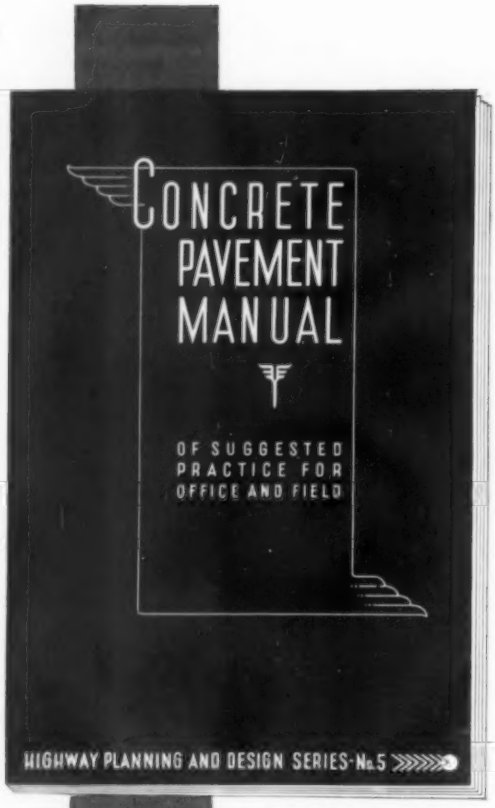
There was little attempt to revise the design of any fire apparatus in changing over to automobile equipment.

New types of fire apparatus are proposed.

Do not miss this article.

ELIZABETH'S 75-FOOT AERIAL LADDER TRUCK DELIVERED NOVEMBER 5, 1934

"The design includes the latest improvements and best practice known in construction of this type of apparatus," says Chief William H. Kennah, city of Elizabeth, N. J. Engine 140-hp., 6-cylinder. Six-wheel brakes of self-energizing internal-expanding type, under control of the driver, and mechanical linkage assure positive connection between brake shoes and brake pedal at all times. Wheels cast-steel, integral hub type mounted on adjustable Timken roller bearings; tires 38 x 7 inches and 40 x 8 on rear wheels, pneumatic. Heat-treated pressed-steel frame ¼-inch; side members 8-inch deep with 3½-inch flanges. Four heavy cross members gusseted and riveted to side of channels; rivets hot-driven. All exposed parts chromium-plated. The American-La France truck carries 377 feet of ladders, double banked, and replaces a 65-foot aerial long in service.



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"CONCRETE PAVEMENT MANUAL"

will help you to build

BETTER ROADS AND STREETS

for less money

Special attention to these subjects:

- Width
- Curves
- Thickness
- Joints
- Reinforcement
- Crown
- Drainage
- Resurfacing
- Concrete Bases
- Colored Concrete
- Concrete Traffic Lines
- Subgrade
- Placing Reinforcement
- Part-Width-at-a-Time Construction
- Finishing
- Curing
- Maintenance

THE new, 72-page "Concrete Pavement Manual" is a compilation of up-to-the-minute methods of design and construction. It is a practical book, written by practical engineers and based on broad field experience. No guesswork. If this book says it—it's been tried and proved.

This Manual will enable you to construct pavements at low cost, yet make them safe, more attractive, more enduring. It will put you abreast of all the latest developments in this field. Send in the coupon today!

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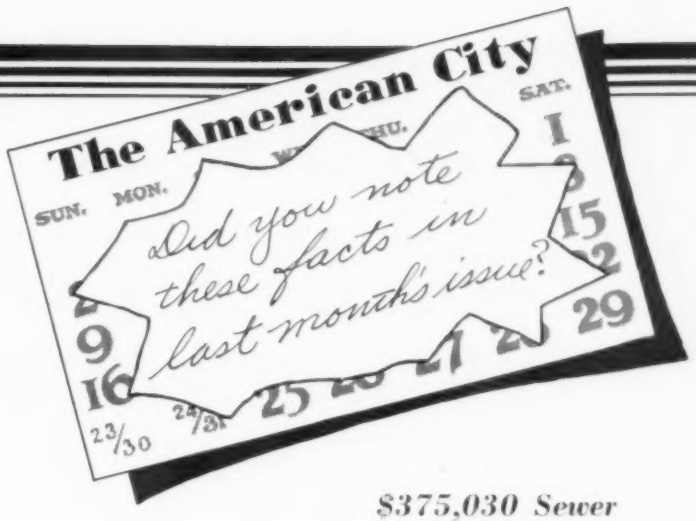


Cost of Sludge Beds

Open sand filters cost $0.30 to $1.00 per square foot; greenhouse coverings $0.85 to $1.70 per square foot of filter area; covered sludge beds $2.00 to $2.75. These are based on installations of 14,000 square feet, and the total annual cost on a 20-year basis is $8.00 to $9.00 per ton of dry solids. Operating cost for removal of sludge cake, including disposal to dump, is $0.40 to $0.60 per cubic yards. Total operating and maintenance costs are $4.00 and $5.00 per ton. Page 44, January issue.

Vacuum Filters for Sewage Sludge

As with sand filters, the type and character of the applied sludge determine the output from vacuum filters. The first step is to condition sewage sludge with chemicals so that on the filter it will part from its water most rapidly. Ferric chloride is the favorite conditioner. Cleveland finds that the 45 to 53 per cent of volatile matter in the digested sludge is not raised or lowered by the quantity of ferric chloride used for conditioning. The behavior of sludge as regards filtering seems to change with the seasons. See page 43, January.

Street Repairs for $80 a Mile

Concerning the repair of its asphalt streets, Fort Wayne says: "No street is barricaded, and the motorist always has the right-of-way." Maintenance cost is $0.007 per square yard, or $80 per mile. Page 45.

Cleaning a Feeder Main

Not enough water from a gravity main from Lake Suntaug to Peabody, Mass., 3 miles, indicated the need for cleaning the line: 48-inch to 24- to 20-inch. This turned out to be a routine operation; but a difficulty was encountered in cleaning a secondary line from Spring Pond to the pumping station. The first 70 feet were the hardest. Owing to insufficient space and the necessity of pushing the accumulation of tubercles ahead of the machine, this short stretch took more than 5 hours to complete. The remaining 3,430 feet of main was cleaned in 15 minutes. The job is described on page 54.

Hattiesburg's Deep-Well Supply

The 3-year-old water-works plant at Hattiesburg, Miss., contains unusual provision for expansion, even to space for an additional diesel should the lighting go municipal. Water comes from ten deep wells, with one that runs continuously into a swimming pool, and the overflow going to a series of fish ponds. A present diesel-engine-generator is provided against thunderstorms that might disrupt the commercial supply of electricity used for pumping to the coke aerator. The aerated water flows to four sand filters, where a head of 2 feet is maintained. Aeration has been so effective that coagulation, originally planned, has not been necessary. The pumping station is in this building, with pressure 35 pounds here and 65 pounds in the city —rising to 90 pounds on a fire alarm. See page 51, January.

Has Regulation Failed?

Successful utility regulation calls for experienced commissioners and enough money. The commission must investigate, then lay down the regulations and defend them, and finally execute them and listen to a stream of objections. Appropriations must cover this triple function or they are inadequate and the regulations will be inadequate. It is suggested that only general costs of state and Federal commissions be paid from appropriations and that all other costs be levied pro rata on the utilities in statewide matters and on the utility concerned in specific cases. Page 55 carries a penetrating discussion of this subject.

Standard Signals

Traffic signs and signals have been standardized to a practical extent, and the accepted shapes, colors, symbols, and when to use them all, are reported on page 65. What do you think of these regulations?

$375,030 Sewer

Cincinnati has recently straightened an abrupt bend in Mill Creek and diverted the sewage from the creek into a new 73¼-foot concrete sewer 8,320 feet long. Page 57.

Commercial Value of Refuse

The wasting of refuse has always been a sore point. There's gold in the dumps, but is there enough to pay for the cost and trouble of extracting it? Ashes have value as fill. Shall an effort be made to sell them or shall they gladly be given away? Of still greater value are paper, bottles, rags, tin cans, scrap metals and silverware. New York City once received as much as $3,000 a week from the salvage of these, with the possibility of developing a much larger market or longer string of concessionaires. There have been no recent efforts to obtain salvage value from New York refuse. A discussion of this subject concludes with a question as to whether or not it would be feasible for home and commercial sources of garbage to burn it on the spot or grind it for suitable disposal to the sewer. See page 58, January.

Fast Track Work

In Brooklyn, N. Y., 1,600 feet of trolley track and surrounding concrete were torn up and a new track was welded and encased in concrete in 23 hours, and service re-established ten hours later. How it was done is told on page 53, January issue.

Water Power

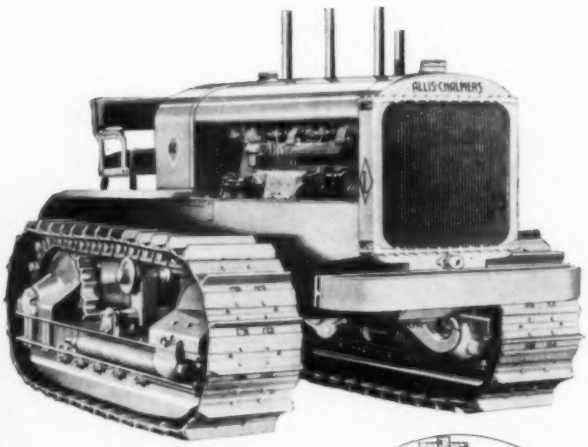
Electric power as the potential lifter of domestic burdens is interesting to the Government. Water power holds the Government's particular interest because of its relation to flood control and the conservation of natural resources. The National Resources Board discusses possibilities for development of hydroelectric current, on page 60.

Certainly..

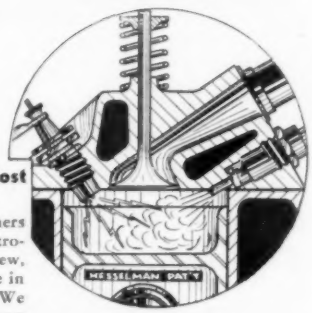
THE A-C OIL TRACTOR USES LOW COST FUEL

AND . . .
it is the only tractor today that
ANSWERS "Yes" TO ALL FIVE

1. LOW FUEL COST
2. LOWER ORIGINAL COST
3. LOWER MAINTENANCE
4. LESS DEPRECIATION
5. LOWEST FINAL COST



THE "LO"
OIL TRACTOR



Sure . . . the Allis-Chalmers Oil Tractor burns low cost fuel. But it doesn't stop there . . . it "goes all the way" in cutting costs . . . by meeting ALL the requirements of low cost operation. In terms of work accomplished—such as yards of dirt at the dump or miles of road built—it is the most economical tractor on the market today.

• *Write for further information.*

Lowest Final Cost Because

In the Allis-Chalmers Oil Tractors, we introduce an entirely new, successful principle in tractor engines. We use a Diesel fuel pump to inject the measured charge of fuel oil into the combustion chamber and ignite it with a spark. We do not depend upon compression for ignition, but use the time tried magneto. This engine operates with less maintenance cost, because the internal pressures are less than one-third those used in the compression type.

Track-type Tractors, Wheel-type Tractors, Power-Controlled Graders, Hand-Controlled Graders, Elevating Graders, Speed Patrol Graders, Stationary Power Units, Track Wagons, Wagon Tracks

ALLIS-CHALMERS
TRACTOR DIVISION—MILWAUKEE, U. S. A.

FEBRUARY, 1935

Vol. L, No. 2

The American City

470 Fourth Avenue
New York

35 Cents, $2 a Year

Will You Grasp This Opportunity?

By HARRY E. JORDAN

President, The American Water Works Association

MR. Mayor, what does the President's four-billion-dollar work relief program mean to you?

Mr. Citizen, is there by chance no public work in your community that needs improvement?

And Mr. Water Department Superintendent, you certainly don't mean to tell me that there is nothing your plant needs?

Let all of us figuratively sit down around the table and talk it over. Our nation's President wants to lead the country back to a normal industrial basis by stimulating useful public works construction now. If you are a good mayor or a good water superintendent or a good citizen, you will understand that this does not simply apply to Notown in the state of Otherwhere, but your own Home Town and your own state.

We can start by digging up one document that every sizable city in America has. Perhaps it's a bit dusty. Perhaps you have not read it lately. It's that last report made by the engineers of the National Board of Fire Underwriters in which they pointed out what was needed to make your fire protection services adequate. Those men do not write fiction. They study facts, and the demerit points they charge up to your city cost your people dollars in increased insurance premiums. Look the report over: make up that list of new feeder main pipe you need; the lot of modern hydrants suitable for present-day fire fighting to take the place of those old under-capacity ones; the distribution system valves you need to protect your people when a break occurs. Just make up that list in an honest effort to correct fully the needs shown in the last underwriters report. It is bound to be one of these much-desired self-liquidating projects—because it reflects itself promptly in reduced premiums your people have to pay. But, much better than that, it is bound to result in reduced fire losses in your city. And surely, if you are a good citizen and love your Home Town, you do not want to burn it up. Malcolm Pirnie was telling facts when he said that the *value* of an adequate supply of water for fire fighting is substantially *greater* than the *cost* of creating it.

But fire protection is not all that a water supply is good for. Did you ever hear the word "drought"? Were you a citizen of one of those fortunate communities that did not feel the effects upon your water supply of the drought of 1930 or 1932 or 1934? Or were you a consumer in one of the great majority of cities which suffered in some way from the shortage of rainfall and storage during these recent years? Absolute curtailment of water service is not the only way in which you may have been affected. The Water Department men should tell you of the worried days and sleepless nights through which they have passed trying to keep you satisfied. Perhaps the water had a peculiar taste at times. No—you're wrong. The chemist at the filter plant was not dumb. He was not using too much chemical—as many of you seem to think. He just had a water to treat that bore too many scars from its previous misadventures to respond perfectly to the treatment he could give it. And the Department Superintendent who does not speak plainly now and tell of the reservoirs or filters or pumps that he needs to maintain good service is failing to do his honest duty.

The National Recovery Committee for Water Works Construction has shown that in the country at large 2,878 water works projects amounting to $556,000,000 were needed in 1933. There were also clearly indicated 1,893 sewage projects amounting to $464,000,000 that needed to get under way. At the end of the PWA allotment period less than $91,000,000 worth of water works projects were under way in any step of the operation. That simply means that the job has hardly started and that everything that has been said about the need for water works construction has borne little fruit and still needs to be said and said again until reluctant communities decide to do the things they already know they should do.

Things are set up in Washington to move faster than they did before. The President and his advisors have the information resulting from the studies of the Water Committee of the National Resources Board. Unless some of us are misinformed, there exists today in Washington a priority list of useful public works, and water supply and sewage collection and treatment projects stand, as they should, at the top of that list.

Here we are on the verge of a renewed public works recovery program. Your own city needs better fire protection and better water facilities. Can you honestly think of any good reason why your city should not apply for funds to build the water plant additions or sewage-handling facilities it needs?

Massachusetts Billboard Cases Decided

The Supreme Court of Massachusetts Sustains the Restrictions in Every Particular—The Decision One of National Importance—A Notable Victory for Public Amenity

By ALBERT S. BARD

BEGUN in 1925, made the subject of a comprehensive report by a master in June, 1931 (after nearly five years of testimony and consideration), made also the subject of a second or supplementary report by the same master, finally exhaustively argued for three days before the full bench of the Massachusetts Supreme Court in November, 1933, the important Massachusetts billboard cases received a decision in that Court on January 10, 1935. Chief Judge Rugg's 58-page opinion is remarkably comprehensive and is eminently satisfactory to the friends of the American landscape and to those who maintain that rural beauty and the amenities of places are proper objects of state protection under the police power and that the rights of the general public are paramount to those of private property and private business. The Court sustains in every particular the restrictions and regulations adopted by the Commissioners of the State Department of Public Works, to whom the Massachusetts Legislature delegates the power of regulation and control, and also the restrictions in the by-law of the town of Concord. The decision is based upon a broad conception of the police power of the state, a recognition of the right of travelers upon the highway to escape from the annoyance of commercial propaganda, and the legality of the protection of public amenity.

Under the general title of *General Outdoor Advertising Company, Inc., and others vs. Department of Public Works,* thirteen different cases were consolidated for common consideration and decision. Tied in with these were two other cases, one a case involving the restrictions imposed by the town of Concord, and the other a case involving the large and conspicuous electric Chevrolet roof-sign which overlooks and disfigures Boston Common and the State House.

The decision supports the regulations and restrictions as to sizes, location, setbacks (the legality of the setback provisions being especially stressed), fees, and the banishment of billboards from locations of scenic and historic interest. The decision on the latter point marks the highest point yet reached in the struggle to protect public amenity. Not only does the Court sustain the right of complete exclusion from scenic and historic places as a part of the right to "regulate and restrict," but it should be noted that the sole ground for the refusal to renew the license for the Chevrolet sign had been its impairment of the dignity of the State House and Common. Yet that refusal is sustained. Of only less significance is the Court's insistence upon the right of travelers upon the highways to be free from the unwelcome intrusion of the billboards.

In barest outline the decision covers the following points among others:

1. The billboard companies may be compelled to relocate their boards in accordance with the regulations, in spite of the expense, without compensation.
2. The billboard business is in a class by itself and may be regulated as such under the police power.
3. One basis for its regulation is the safety of travelers. There is danger both from obstruction of view and distraction of attention. Inattention causes accidents. Billboards cause inattention.
4. The regulations are also legal in that they are designed to protect travelers from the annoyance of commercial propaganda. The traveler has a right "to a peaceful and unannoyed journey."
5. Scenic beauty contributes a highly important factor to the welfare of the state; "to preserve such landscape from defacement promotes the public welfare and is a public purpose." To this end advertising on private property within public view may be controlled. Even if the regulations "did not rest upon the safety of public travel and the promotion of comfort for travelers, we think that the preservation of scenic beauty and places of historical interest would be a support for them. Considerations of taste and fitness may be a proper basis for action in granting and denying permits for advertising devices."
6. In a town of the character of Concord the restrictions may legitimately include and apply to business districts as well as to the others, without special exceptions or special concessions to the billboard business in business districts.
7. The Chevrolet sign overlooking the State House and Boston Common may be refused a permit upon the sole ground that it is "an inappropriate and obnoxious intrusion into that locality," without regard to considerations of safety, health or morals. Considerations of "taste and fitness" are sufficient to exclude.
8. The effect of the 1918 amendment to the Massachusetts Constitution was to overrule a decision of the Supreme Court in 1905 limiting the police power of the state in its control over outdoor advertising. The police power over this subject is now complete.
9. The regulations in question are also wholly in accord with the Federal Constitution.

The national significance of the decision is greatly emphasized by the fact that the admirable and persuasive argument made by counsel serving the public interest against the billboard companies was expressly based upon two fundamental points, both of which are sustained by the Court: (1) there is a conflict of interest between the billboard industry on the one side and the public on the other, the billboard industry claiming the right to broadcast commercial propaganda into parks, highways and homes by means of conspicuous structures erected on private property, and the public claiming the right to escape from this propaganda in their parks, highways and homes; and (2) in this conflict of interests the police power of the state, either direct or delegated legislative power, may determine which right shall prevail over the other and in what degree; in short, the police power may adjust the interests and decide the conflict.

The billboard industry has always claimed that its business interest is paramount. The decision in the Massachusetts billboard cases is clear-cut to the effect that the legislative power may decide, and may put the public interest first and the business interest second without impairment of constitutional rights under either the Massachusetts or the Federal Constitution. This decision is now not only the leading billboard case in the country, but the leading case on the protection of public amenity through the police power.

Cutting the Costs of Contract Collection of Garbage in Seattle

Number of Contracting Units Reduced and Five-Year Contract Awarded

SEVERAL years ago the authorities of Seattle concluded that the cost of garbage collection and disposal was far too high. At the time, the work of collection was done by two groups of contractors and subcontractors, and the yearly cost had risen to more than $900,000. In 1932, accordingly, the City Council advertised for bids for a single contract and stipulated that the total yearly cost should not be more than $410,000. The contract was awarded to the Cities Contracting Co. for a period of five years, with a bid of $364,278 per year. The company is a copartnership of well-known contractors in the material-handling field in the Pacific Northwest.

With its population of almost 400,000, its many hills, its irregular east and west water boundaries, and its long north-and-south area extending for more than 12 miles, shaped like a sheaf of wheat, the width of which at the middle is just a bit over two miles, and more than seven miles at either end, Seattle presents a number of problems in the regular collection and disposal of its garbage. The Cities Contracting Co. has been successful in solving these various problems by careful planning and management, and even with the great saving afforded the city by its lower cost bid, it has been doing the work at a profit.

The Collection Fleet

With the exception of two ½-ton and two 2-ton trucks, the fleet of 54 International trucks is made up entirely of 1½-ton units equipped with 8-yard steel dump bodies operated by hand hoists. The 1½-ton truck has proved unusually flexible and efficient in this class of work. The ½-ton trucks are utilized mainly for general run-around work, and although the 2-ton trucks were first used in the business section, they are now employed mostly for the transport of supplies. Even in the business section the 1½-ton truck has proved itself because of its flexibility. The name of the company is painted in yellow letters on each truck. In addition to the driver, there is a helper, who is called a "swamper," on each truck. In some sec-

TWO TRUCKS DUMPING FROM THE SPECIAL TIMBER APRONS

Route No. ..... Date .....

Address .....

Cross Street .....

Name ..... Phone .....

COMPLAINT

Missed All ..... Part .....

Do Not Replace Lids ..... Cans .....

Scatter Garbage .....

Crossing Lawn .....

New Service .....

Driver's Report .....

1

DAILY TRUCK REPORT

To be prepared and turned in daily by Drivers.

Route No. ..... Truck No. .....

Date .....

Number of loads hauled .....

Dumped at .....

Speedometer reading IN .....

Speedometer reading OUT .....

Signatures .....

of .....

Helpers .....

Trouble reported .....

Driver: .....

2 **Check oil and tires regularly.**

ROUTE NO. 50

	MON	TUES.	WED.	THUR.	FRI.	SAT.	SUN.
John Doe	D	O	D	D	D	D	O
Jim Jones	S	S	O	S	S	S	O
Ed Smith	O	D	S	O	O	O	O

3

4

SPECIAL INDIVIDUAL RECORD SHEET
(One for Each Truck)

	MILEAGE				No. of Loads	GASOLINE		Oil
	Out	In	Today	To Date		Today	To Date	
1								
2								
3								
4								
28								
29								
30								
31								
Total								

FORMS USED BY CONTRACTOR FOR GARBAGE COLLECTION IN SEATTLE

tions there are two swampers for each truck.

A careful study of the system utilized by the Cities Contracting Co. in the supervision of its personnel and trucks and the care with which the units are routed and serviced, and data on all operations recorded, quickly discloses why the work is done efficiently and with dispatch and at a profit to the company and a saving to the city.

Dispatching the Trucks

An important feature of the Cities Contracting organization is the dispatcher's office maintained in the company's large garage. This garage measures 120 x 110 feet in plan, is two stories high and large enough to house the entire fleet. A close check of every truck at any time in any working day is facilitated by a dispatcher's book, which consists essentially of a key map showing the entire city divided into numbered districts and then large-scale maps of every district, with all streets shown in large size and with their names. Collections are made once a week in the residence districts, every other day from apartment houses, and every day in the business section. Each detailed district map accordingly is divided into sections with different colors, and on each section is painted the day of the week on which the truck collects in that section. Thus, when a resident calls to find out when garbage will be collected, a quick glance at the proper district map tells the dispatcher, with his knowledge of the route traveled by each truck, within fifteen minutes or so when the collection will be made. For those sections in the business district where collections are made each day, special large-scale maps are provided.

Particular care is exerted by the dispatcher in making comprehensive records of all complaints, and for that purpose a special form, measuring 4¼ x 3½ inches, has been devised, which is filled out in triplicate. The form is printed so that a variety of information on a complaint may be quickly recorded by mere check marks, and there is a place below on which the driver must make his report. Naturally, drivers do not like to have complaints sent in about their work, and the knowledge that every complaint is recorded in this way and requires a report from the driver instills a desire in him and in his helpers to exercise care in their work at all times.

Printing the Forms

An interesting method has been devised for printing these forms. Two sets of three forms separated by perforations are printed on a sheet 13 x 8½ inches in size. A blank space 2 inches wide at the left, without perforation for the left side of each inside form, is provided so that a number of these sheets may be bound in a book. The three forms of each set are side by side and attached to each other by perforations, the inside and outside forms being printed on the front side of the sheet and the middle form on the back side of the sheet. By folding the sheets along the perforations, with the outside form on top of the middle form, and these two in turn on top of the inside form, and inserting small pieces of carbon paper between them, the writing of the form in triplicate is made easy. Since the left side of the inner form is not perforated, this form must stay in the book, and serves as an office record. Since the other two forms are perforated they are easily removed; one is passed on to the driver and on it he must write his report and then return it to the office, and the other is for the checker. The two outer forms of the top set on each sheet are also separated by perforations from the lower set.

Other forms on which pertinent information on the operation of trucks and activities of drivers and swampers is recorded are also reproduced in the accompanying illustrations. One of these is 7¼ x 4 inches in size, Form No. 2, and is entitled, "Daily Truck Report." One of these is turned in daily by each driver. Each morning when the driver goes to work, he takes one of these forms and stamps on the back of it with the time-clock located in the garage the time he leaves for work. He repeats this time-recording operation when he goes off duty. The bookkeeper checks each of these daily reports and transfers the information written thereon to his time-book. He also records on special sheets, one for each truck, Form No. 4, mileages, number of loads, gasoline consumption, and oil consumption. Since the 5-day, 8-hour-per-day, 40-hour-week plan has been adopted by the Cities Contracting Co., another form, 5½ x 2¾ inches, is utilized, Form No. 3. One of these forms is made out for each route and shows how the men are employed for each week, D indicating driver; S, swamper; and O, days off. A special card has also been prepared for reporting information on tires. One of these is filled in for each tire and contains data on the date the tire is put on, when it was taken off, and all repairs.

Operating the Dumps

The Cities Contracting Co. employs 125 men, including garage mechanics and a night workman who regularly greases all trucks and washes from ten to fifteen trucks each night. Among the employees there are seven men who are called dump men, one being employed at each of the seven dumps. These dumps are located in low spots in various parts of the city. Each dump is built up to a thickness averaging 12 feet and as the dump attains the desired thickness a layer of dirt 1½ feet thick is placed on top. To facilitate the backward movement of the trucks to the very shoulders of the dumps, plank aprons are used. At the larger dumps, three such aprons are used, so that three trucks may dump at one time.

Training on the Job

CITY administrators and other officials will now be able to get further professional training for their jobs while they work, according to the International City Managers' Association, which has announced establishment of its Institute for Training in Municipal Administration.

The Institute has prepared a series of five extension courses in municipal administration, the first of which is on the organizations and functions of municipal government. Others will be on public works administration, municipal personnel, fire administration, and the technique of municipal management.

Several courses originally prepared by the Institute of Public Administration in New York City and others added by the School of Citizenship and Public Affairs of Syracuse University have been taken over by the Institute and completely rewritten in the light of recent developments. The Institute plans eventually to make available courses covering every branch of municipal administration.

"How We Reconstruct Nature"

THE time will come, THE AMERICAN CITY hopes, when America will produce a writer on city planning whose appeal to young and old in this country will be comparable to that in Russia of the young Soviet engineer who writes under the pseudonym of M. Ilin. To any who may not already have read it, we commend the portion of Mr. Ilin's newest primer, "How We Reconstruct Nature," the story of the plan for the alteration and diversion of the Russian waterways, as translated in the January, 1935, *Harpers*. As that magazine says in an editorial note:

"In 1931 the American reading public was startled and then fascinated by Mr. Ilin's 'New Russia's Primer: The Story of the Five-Year Plan.' The primer was intended as a textbook for Russian children of from 12 to 14, but in the end was read by people of all ages in many countries. . . . So great was the success of the book that other Russian primers by the same author were brought out in this country."

It will be an achievement indeed when an American article on the planning of land or water resources will have such general appeal as to be translated and published in popular magazines of other countries.

Maintaining a Reputation for Smooth Sheet Asphalt Paving

Hartford, Conn., Has Continued Its Paving Program Through Lean Years

PUBLIC Enemy No. 1 of the Street Department of Hartford, Conn., is the clay subgrade that underlies all its streets. This racketeer has been overcome by a uniform 6-inch reinforced concrete foundation for all paved streets, and sheet asphalt is the standard paving. Sheet asphalt is laid in two 1½-inch courses, binder and top, with the following analyses:

	Binder	Top
¾-inch stone	75 per cent	None
Sand	20 per cent	80 per cent
Limestone dust, 200 mesh	None	10 per cent
Asphalt	5 to 6 per cent	10 per cent
Temperature for laying, 300° F.		

The concrete base has been used for at least twenty years but for only the last five years has it been reinforced throughout with a 30-pound mesh. The concrete is a 1:2:4 mix.

"Patch with the Same Material"

It is the motto of the Department to "patch with the same material," so that the compression will be the same and thus eliminate the manifold chances of slight depressions in the surface which develop rapidly into "bumps," with attendant noise and destruction of the pavement. The only exception to this motto is emergency patching in winter. Patching is usually discontinued for the calendar year about Christmas time "due to a combination of finances and the weather." If it becomes necessary to make emergency patches after that date and before the start of the next year's patching early in April, the Department resorts to the use of cold patch material, which is considered only as a temporary expedient. These patches are 2 inches in maximum thickness.

Two kinds of standard patches are used in Hartford, both made with the standard paving mixes tabulated above —the regular cut-out patch, and the "skin patch." The latter needs to be particularly described even before the standard method of patching, because the use of the term "skin patch" is open to such diverse interpretation. The skin patch is used when there is no failure of the sheet asphalt pavement itself but merely a settlement of the base which has caused a depression in the surface which holds water and causes rapid deterioration of the paving material. Hartford does *not* merely fill the hole with top material, hand-tamp it and trust in a divine power to keep the material in place against the hammering of heavy trucks. That is the method used by far too many other cities and villages—to the delight of those who would sell materials as rapidly as possible. Fortunately, there are few, if any, of that type of sales organization in business today, for witness the many highly instructive, illustrated booklets that are available on the proper methods of making patches in asphalt pavements.

Hartford has devised its own method for the skin patch, and it is just as effective as the regular patch of full depth. The base is explored thoroughly by hand picking a section to learn whether the entire base should be removed, or merely the sheet asphalt and only a skin patch made. If the latter is to be made, the surface of the old asphalt is gouged to a depth of about ¾-inch over a considerable part of the surface, "well-peppered," as the maintenance engineer expressed it, so that the new material will bond well with the old and not creep. At the edge of the depressed area the pavement is cut with a vertical edge to about one-half the depth of the sheet asphalt and a shallow cut made so that the top material from the cut to the depression is removed. Then the edge and the entire depression to be filled are painted with the same asphalt that is used for the mix, and immediately the hot patch is made, tamped and rolled. It is there to stay—they have been using this method for five years and the first patches are still in place.

The standard patches are made in the usual manner of good practice. The old material which has deteriorated by breaking-up from any cause whatsoever is removed by cutting out the entire surface, right down to the concrete base, with the edges vertical. Then the edges are painted and the binder and top material are placed, tamped and rolled just as though a new section of sheet asphalt pavement were being laid.

The repair of pavements where utilities have made cuts for service connections is an important part of the maintenance work in any city. In Hartford they cut back the 6-inch concrete foundation for a distance of 1 foot, and the asphalt pavement for 18 inches from the edge of the cut, and replace the foundation and the surface with the same thickness of material as in the original paving. The backfill must be done by the utility under the direction of the Street Department, with sand and clay or trap-rock and sand. No puddling is permitted, for the water simply weakens the adjacent clay and starts trouble. The backfill is carefully tamped with hand or pneumatic tampers to as near the density of the original ground as possible. No fees are charged for permits for cuts, but the permittee pays all the costs.

Maintenance by Contract

Whenever a reasonably large paving contract is to be let, the city requires that the contractors bidding on that work also bid on the maintenance of the sheet asphalt paving of the city for the next year. These bids cover all the patching of all kinds, large and small, and the contractor must be ready to supply patches of any size at any time. Except in the case of emergencies, which are usually taken care of by the Department with cold patch, the contractor is given a reasonably large number of patches to work on at one time, so that he is not penalized by having to start up his plant for a few yards of sheet asphalt each time. Since 1930 patching has averaged 28,000 square yards a

year, while in that last boom year there were 37,133 square yards of patches laid. This is an excellent indication of how well Hartford has kept up its maintenance program and accounts for the fine condition of its pavements. It is true that 1934 has seen the smallest amount of patching of any of the last six years, and fully 14 per cent of the patching of the past year has been skin patching.

The contractor brings in his own portable asphalt plant, if he is from outside the city, and buys his materials wherever he wishes. He is not permitted to reclaim any of the old asphalt material taken up in patching. On new contract work where the removal of old macadam is involved, the city reserves the right to claim the excavated material, and the contractor hauls it free of charge a distance of 2,000 feet. Any additional hauling is paid for at the rate of 1½ cents per cubic yard per 100 feet.

Payment for patching is divided into three classes: (1) skin patches; (2) patches over 100 square yards in area; and (3) patches under 100 square yards in area. The prices for 1934 for these classes of patches were $1.00, $1.25 and $1.45 per square yard respectively.

Street maintenance in Hartford, Conn., is under the direction of Leon F. Peck, Superintendent of Streets, with H. I. Skillton, Division Engineer, in charge.

New Calumet Sewage Treatment Works Nearing Completion

Six-Million-Dollar Chicago Project Started in 1930

THE Calumet sewage treatment works extension now under construction, and more than two-thirds completed, is designed for the purpose of ultimately treating all of the sewage from the area lying between 87th Street in Chicago on the north, and 159th Street on the south, South Crawford Avenue on the west, and the Indiana state line on the east, a total area of about 88 square miles. The population in this area is expected to be about 455,000 in 1945, contributing an estimated average sewage flow of 136 mgd, for which the present installation is designed. Space has been left and provision has been made to increase the average capacity to 200 mgd if required in the distant future. When the plant is placed in operation, in late 1935, the average flow will be about 75 mgd and the tributary population about 238,000. Additional sewage will be brought in, as interceptors are extended to outlying areas. All parts of the plant are designed to handle 50 per cent in excess of average flows.

Sewage Pumped

Sewage coming to this plant will be lifted 39 feet by the pumps, passed through mechanically cleaned rack screens with ⅝-inch clear openings, settled for about ten minutes, when the plant is operated at a rate of 136 mgd, in tanks with mechanical removal of the settled solids, and then treated by the activated sludge process. This involves blowing air through a mixture of sewage and activated sludge for about five hours in aeration tanks, the sludge in the mixture being returned from previous aeration of sewage and activated sludge in a continuous process. The sludge will appear as a light-brown flocculent mass in the tanks, containing certain biological growths which are developed in the process. By aid of these growths and the air used for aeration, the finely divided or colloidal matter in the sewage will be removed and the organic matter in the solution largely oxidized to stable or non-putrescible forms.

The aerated sewage will be settled in the final settling tanks and the sludge drawn off from the bottom. Part of the sludge will then be returned to the sewage continuously entering the aeration tanks in an amount equal approximately to 20 per cent of the sewage by volume. The clarified sewage will be discharged from the surface of the final settling tanks as a clear, stable effluent free from suspended solids. It will be discharged into the Calumet Sag Channel to the west of the controlling works in Blue Island.

Sludge to Be Burned

The sludge not returned for use in the process, together with the preliminary tank sludge and screenings, will be concentrated in tanks and partially dewatered by vacuum filters. The organic solids in the filter cake will then be destroyed by incineration, leaving only an odorless and inert ash for disposal. The initial average incinerator capacity will be 40 tons of dry solids per day.

The Pumping Station and Blower Building

The contract for the pumping station and blower building, which amounted to $1,334,498, called for the construction of the building 116 feet wide by 276 feet long with the substructure extending 32 feet below the present grade. The superstructure will be approximately 40 feet high. The contract covers the installation of equipment purchased under previous contracts including two 40,000-cfm blowers, two 30,000-cfm blowers, one 58 mgd, one 78 mgd, and one 97 mgd sewage pump, three 45-cfs pumps for return sludge, and the necessary gate and check valves to be used on the sewage and air lines. Space is left in the station for one additional sewage pump, one sludge return pump, and one blower.

The approximate quantities involved in this contract are 40,000 cubic yards of excavation, 10,500 cubic yards of concrete, 1,241,000 pounds of reinforcing steel, 847,135 pounds of structural steel.

Screen House, Sludge Tanks and Settling Tanks

The contract for the construction of the screen house, preliminary settling tanks, sludge concentration tanks,

meter vault and miscellaneous conduits was awarded for $279,800.80. The screen house, which measures 84.5 x 36 feet, contains three mechanically cleaned rack screens and two screenings grinders. There are four preliminary settling tanks, each 32 feet wide, 100 feet long and 12.5 feet deep, with conveyor type sludge-removal mechanisms. There are two sludge concentration tanks, each 17.2 feet wide, 80 feet long and 12.5 feet deep, also equipped with conveyor type sludge-removal mechanisms.

The quantities called for in the construction under this contract were 14,500 cubic yards of excavation, 5,500 cubic yards of concrete, 900,000 pounds of reinforcing structural and miscellaneous steel, and 415,000 pounds of cast iron pipe and fittings.

Aeration and Final Settling Tanks

The contract for the aeration and final settling tanks was awarded for $2,109,627.40. There are two batteries of tanks, each battery consisting of eleven aeration tanks, each 425 feet long, 34.5 feet between walls and 17 feet deep, and eight final settling tanks with revolving type sludge-removal mechanisms, each 91 feet square and 15 feet deep.

The approximate quantities under this contract are 246,048.12 cubic yards of excavation, 60,000 cubic yards of concrete, 6,000,000 pounds of reinforcing and miscellaneous steel, and 4,000,000 pounds of cast iron pipe and fittings.

In September, 1934, bids were opened for two more contracts. One covered the construction of an influent sewer from the old Calumet pumping station to the new one with connections for future sewers from the south, a by-pass for the new plant and an effluent by-pass around the old pumping station. The other was for the purchase of diffuser plates to be installed in the aeration tanks.

Contracts have been let for the sludge disposal plant and for miscellaneous work required to complete the plant for operation.

The work is being done under the direction of Philip Harrington, Chief Engineer of The Sanitary District of Chicago, under an agreement with the Federal Emergency Public Works Administration, whereby it purchased the bonds of The Sanitary District of Chicago on a 4 per cent basis. The Public Works Administration is represented by Joshua D'Esposito, Resident Projects Engineer (PWA), and Carl H. Bauer, State Engineer Inspector (PWA).

Newark's Radio Abolishes Four of Eight Precinct Stations

By **MICHAEL P. DUFFY**
Director of Public Safety, Newark, N. J.

RADIO appears to be the finest tool which science has given to the police. It is potent as both an offensive and a defensive agent against crime. Its value as a crime deterrent, too, is of great importance, and its usefulness in this direction may well finally outweigh all its other advantages. Be it crime or fire, that ounce of prevention is sometimes priceless.

Newark's radio police system is but a few weeks old, yet numerous apprehensions of crime and criminals are already on the record. In addition, radio must take credit for the prevention of many fires. What might have been —to some one—disastrous destruction has been forestalled by the immediate arrival and use of portable extinguishers, with which all roving cars are equipped. All fire alarms are instantly broadcast.

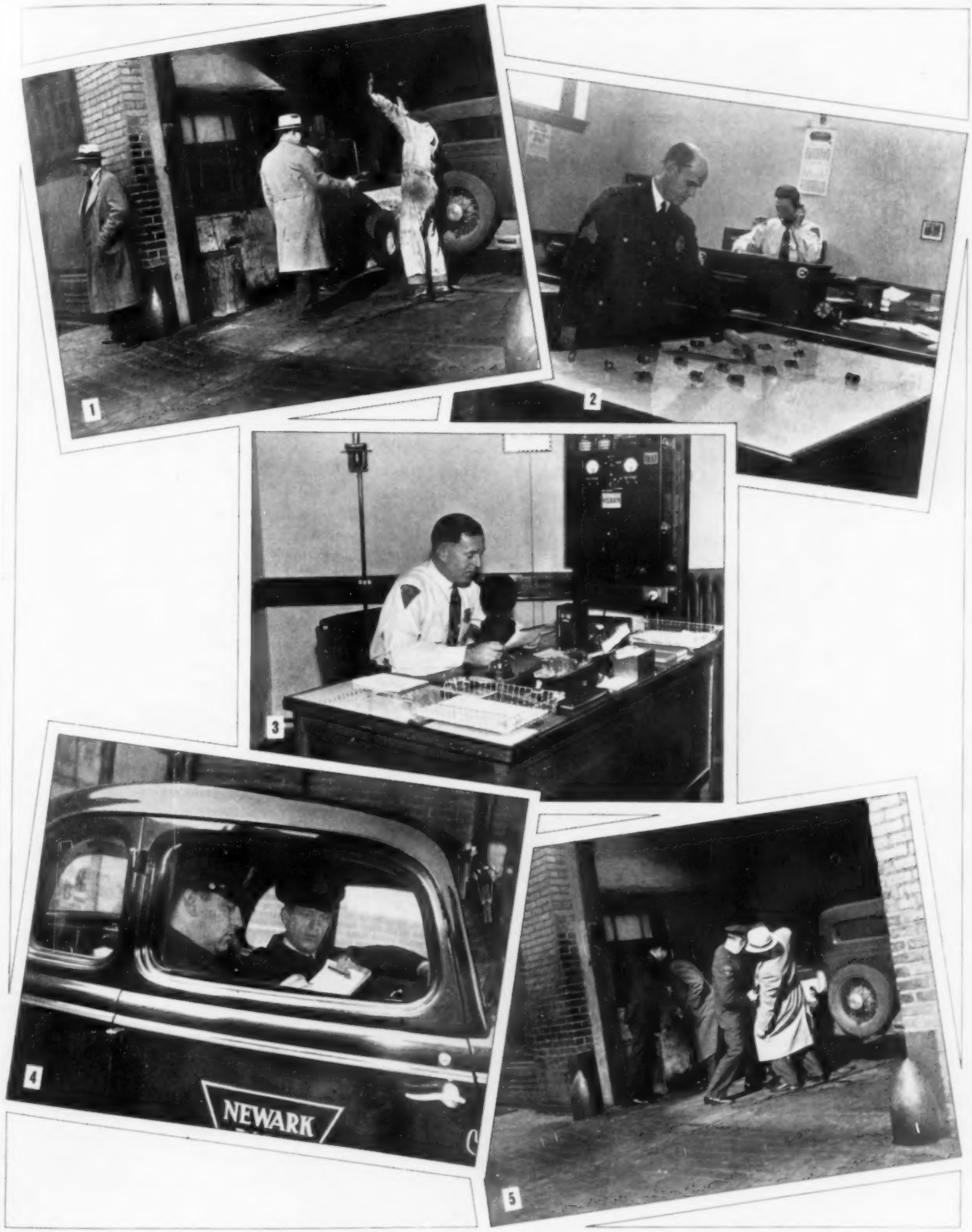
A recent alarm illustrates the point: A fire started within a garage, endangering a car and the neighborhood. The owner raced to the nearest box, sent in an alarm, and returned to find the fire bested by the radio police.

Through what appeared to be necessity, Newark's police radio system represents some important departures from past practice, technical and otherwise. The northeastern portion of New Jersey is metropolitan in character. More than 100 cities and large towns are crowded together within a relatively small area. New York City, just across the Hudson River, meets the radio requirements of some seven million residents with three radio transmitters. Would metropolitan New Jersey, with its more than 100 politically separate municipalities, require a separate radio transmitter for each? If so, how would the necessary channel facilities be supplied?

Radio channels are definitely limited. The demand for them exceeds the supply. A few have been assigned to state and municipal police. Of these, what are known as the conventional frequencies—centering about 1,600 and 2,400 kilocycles (180 and 125 meters)—seemed, particularly after darkness, to be most crowded. The ultra-high frequency experimental police assignments between 30.1 and 40.1 megacycles (9.9—7.5 meters) were not crowded. The range of transmission showed uniformity, both day and night. Shadowing effects often caused by large steel structures were absent throughout the experiments. No interference from distant points would be expected because of the "optical" nature of these high frequency waves, and interference from static during summer thunder showers was essentially nil. Further, the use of the ultra-high frequency would make possible the augmentation of the system by the installation of transmitters in police cars at some future date, if two-way operation becomes desirable.

For these reasons, an ultra-high frequency assignment was applied for. Further, the choice of both antenna-transmitter location and of power was made with a view to serving not only Newark itself, but some 25 or more adjacent municipalities. If all cities and towns in the area were to derive the benefits which a radio-equipped police could supply, cooperative operation was imperative.

Five ultra-high frequency channels are available. All are now in use within this area. Duplication of assignments must result in some interference, or require a time-sharing agreement. Excepting in the case of Newark, no



NEW NEWARK RADIO STAGES A PERFECT CRIMINAL APPREHENSION

1. The crime. 2. A witness to it telephones headquarters. 3. Headquarters broadcasts for immediate attack. 4. A cruiser receives the call — . 5. And closes the incident

Western Electric Co. built the Newark police radio; Bell Telephone Laboratories designed it; Graybar Electric Co. sold it

Photographs by courtesy of *Sunday Call*, Newark; A. W. Johnston, staff photographer

one of these transmitters serves more than its own municipality, although there is no reason why each of these five ultra-high frequency assignments should not serve a territory equal to that which is being served by the Newark installation. Radio waves recognize no political boundary lines.

Transmitter and Antenna

Since the ultra-high frequency waves act like light waves, and are not effective beyond the "horizon," the tip of the flagpole on Newark's tallest building was chosen to support the antenna. This antenna, some 22 feet in length and nearly 800 feet above ground, has the power fed to it through what is known as a concentric transmission line, chosen because the outer member of the two-wire line may be and is grounded. The transmission line stretches from the transmitter equipment on the 34th floor of the building some 200 feet below the tip of the flagpole. It reaches the antenna by passing indiscriminately through cement floors, plaster walls, along steel girders, and, finally, up through the center of the steel pole, to emerge at the tip of the pole, where, through proper "coupling circuits," it is freed of its power.

The transmitter as a power generator is excited by a small crystal of quartz, which holds the equipment very exactly to its assigned frequency. The generating equipment itself amplifies the feeble oscillations supplied by the crystal until the total energy fed to the antenna has reached 500 watts. This 500-watt carrier is molded or modulated by voice currents which originate on the 4th floor of the Newark Police Headquarters, approximately half a mile away from the transmitter location. Here, telephone switchboards, teletype, machines, and radio equipment are intimately concentrated. Into this point come all fire alarms, teletype alarms, burglar alarms, and calls for police, and from this room, of course, go out all broadcasts to cars. Police Headquarters is connected with the radio transmitter with special telephone lines provided in duplicate, in addition to which a third telephone circuit is available in case of emergency. The radio equipment within this room consists of a microphone and amplifiers necessary to boost up the voice currents before they start their journey on the telephone line.

The Receivers in Cars

In all, some 40 cars are equipped with radio receivers. Of these, 20 are assigned to 24-hour duty, and are in continuous operation on the streets. Ten more assigned to 24-hour duty have been purchased and will shortly be placed in service. Of the remainder, the majority are cars assigned to detective service, while a few of the cars operated by officials of the city are also equipped.

The receivers are 6-tube units, powered by small motor-generator sets, which secure their power from a heavy-duty battery on the car. This battery, in turn, is charged by a heavy-duty generator driven by the engine, and all the units included within the car equipment are so designed as to permit of very quick replacement. For example, the substitution of a radio receiver can be made in less than one minute. Such substitutions, when they become necessary, are made by a radio-equipped service car dispatched to the aid of the patrol car in trouble.

The receivers are equipped with automatic volume control which prevents sudden bursts of sound, and which maintains required volume of sound in such small areas as might be supplied with a weakened signal. The receivers are located on the rear of the seat, speaker upward. Car antennas are completely concealed. If otherwise unmarked, the cars cannot be identified as radio cars.

The Personnel

The broadcast room staff consists of a lieutenant and a sergeant in charge, and eight policemen, who take and broadcast the alarms. The staff at the transmitter station consists of the chief and four radio operators—all policemen, holding the radio licenses. The maintenance division is staffed by five men. Here the equipment consists of one repair car, radio-equipped, fitted up for repair operations on the street if that is essential. Ordinarily, all defective equipment is exchanged, the operation taking a minute or so.

The police personnel is under the direction of a deputy chief. A technical engineer is in charge of the system and responsible for its maintenance and operation. A consulting radio engineer planned the system, chose the location of the transmitter equipment, wrote the technical specifications, and supervised the installation. Equipment was supplied and installed by the successful bidder.

We are told by all who visit us that the Newark system marks a definite step in advance of anything else that has been done in connection with municipal radio police installations. From our own observation this certainly appears to be true. We enjoy complete, high-grade coverage, and great dependability. As a result, the efficiency of the police force has been vastly increased. The new flexibility of the force permits of a more thorough policing of the city and, at the same time, a considerable reduction in the size of plant and overhead costs. Before radio, Newark found eight precinct stations a necessity. Within the past few weeks four of these have been abolished.

Viscount Snowden on the Land Problem

IN a speech delivered on November 14, 1934, and reported in the December number of *Land and Liberty*, Viscount Snowden quoted instances of how British local authorities are being compelled to pay "through the nose" for land acquired for housing and other public purposes. Discussing his solution of the problem, the former Chancellor of the Exchequer said:

"What do we propose? We propose that rates should be shifted altogether from improvements and that they should be levied upon site value. The effect of a change like that is perfectly obvious. You will encourage building and a higher type of building. If agricultural land and vacant sites in urban centers were rated on their real site value, land which is being held back as it is at present would be forced into the market, and the effect would be that land would be cheaper, a stimulus would be given to building, and encouragement would be given to put into the building itself what had been saved by the rates upon the improvements which it had hitherto paid."

Discussing editorially the relation of taxation to the problem of slum clearance and a scheme under consideration by the present English Government for housing subsidies to local authorities based on a sliding scale according to the value of the land, *Land and Liberty* says:

"Such arbitrary methods do little to solve the problem. What is wanted is the continuous and effective pressure of the taxation and rating of land values. This would soon induce the owners of slum property to reconsider the position. It would apply to all land immediately, whereas the present cumbrous, expensive and dilatory methods involve the gradual purchase of slum areas by local authorities, and the owners are encouraged to obstruct progress, as they look for ransom at the expense of the public."

Chlorinated Copperas Treatment of a Low Alkalinity Surface Water

Chickasaw Plant of Alabama Water Service Co. Supplies the Suburbs of Mobile

THE Chickasaw filtration plant of the Alabama Water Service Co. is one of the most interesting within the state, for it offers a variety of treatment and possibilities for further variation as needed. The plant is located about 1½ miles west of Chickasaw, a suburb adjacent to Mobile, and supplies the towns of Prichard, Chickasaw, Whistler and Plateau, having a total population of about 8,700.

The source of water is Eight Mile Creek, which runs fairly uniform in character as regards turbidity and chemical constituents, but with low alkalinity. The intake from the creek is a concrete basin 4 feet wide, 10 feet long and 9 feet deep, with a wooden gate at the end to shut it off for cleaning or repairs. This gate acts as a scum-board, keeping out floating trash, since it is opened only to a point about 6 inches below the surface of the water. The intake contains a coarse screen of bars spaced 1 inch apart, a ½-inch mesh screen, and a ⅛-inch mesh screen, which are hand cleaned as needed. The water flows by gravity through a 24-inch cast iron main to the raw-water pumps, a distance of about 600 feet.

Pumping Plant

The pumping station contains both the low-lift pumps delivering water to the filters and the high-lift pumps delivering the treated water to the distribution system. The low-lift pumps comprise one Dayton-Dowd 700 gpm, 5 x 6-inch centrifugal driven by a Westinghouse motor, and a stand-by DeLaval 1,500-gpm, 6 x 6-inch centrifugal pump driven by a General Electric motor. The low-lift pumps deliver the raw water to a 12-inch header to the mixing chamber. The water in the suction line of these pumps stands about 2 feet above the top of the pumps, eliminating the need for priming equipment. The high-pressure pumps located on the ground floor—the low-lift pumps are in the basement—consist of a 2,000-gpm centrifugal with a 150-hp motor and a 1,200-gpm unit with a 100-hp motor, all Allis-Chalmers equipment. These pumps discharge into a 14-inch cast iron line to the distribution system, on which rides a 200,000-gallon elevated tank which permits the plant to shut down for long periods. There are four pumping periods per day, corresponding to the periods of maximum use within the area. A Wallace & Tiernan MSP solution feed chlorinator is used to apply 2 pounds per million gallons of chlorine to the treated water as it leaves the plant. A Builders Iron Foundry venturi meter measures all water delivered to the distribution system.

Chemical Treatment

The low-lift pumps discharge through a 14-inch main into the first section of a seven-compartment mixing chamber, from which the treated water flows into the coagulating basin, which has a retention period of about six hours at normal flow. The coagulating basin is 140 feet long, and 49 feet 6 inches wide, and the water is 10 feet deep. There are three around-the-end baffles the long way of the basin, so arranged that the rate of flow of the water is less in each of the four sections, giving time for finer floc to settle in each section. A 24-inch drain line is provided for cleaning the basin. The basin has an approximate capacity of 500,000 gallons. Water can be admitted to the coagulating basin from the fourth, fifth, sixth or seventh sections of the mixing chamber so as to prevent the breaking-up of an early floc by too violent mixing. The water enters the coagulating basin from the mixing chamber through a lattice stilling wall.

The plant is equipped to pipe lime and alum for treat-

THE CHICKASAW FILTRATION PLANT AS SEEN FROM A POINT NEAR THE RIVER INTAKE

THE COAGULATING BASIN (RIGHT), FILTER BUILDING AND CLEAR WATER BASIN (LEFT)

ment of the water, but these are not used at this time for that type of treatment. Three Wallace & Tiernan dry feed chemical machines are located on the ground floor of the filter plant, and at present one of the machines is used to feed copperas to the water, and the second lime, the third not being used. The copperas works best with a low pH, and the raw water has a pH of 6.0 and an alkalinity of 3 ppm. When alum was used, the water was corrosive, and if lime was added to take out that property, the color came back, provided enough lime was added to get a neutral water. This led to the trial of copperas for the treatment, using 1 grain per gallon under normal conditions, with a slight increase after heavy rains. Lime is added at the three-quarter point of the coagulating basin to bring up the alkalinity, and more can be added to the clear well adjoining, of 500,000 gallons capacity. This is done when the pH of the filtered water drops to 7.2.

Novel Fabricoid tops have been made to cover the circular tops of the dry feed machines. They are merely round pieces with strong rubber bands run around the edges in a hem, and they hug the edge tight, preventing any dust from escaping. The tops of the post carrying the arm and chain for breaking up the chemical in the bin were cut off even with the top of the bin so that it does not rub the Fabricoid.

The chlorine is added by a Wallace & Tiernan MSV solution feed machine located in a separate room on the ground floor of the filter building, and is applied to the water next to the solution of copperas at the entrance of the mixing chamber. Chlorine is applied at the rate of 30 pounds per million gallons.

Filtration

A low-lift pump of 700-gpm with a V-belt drive from a 10-hp motor, all Allis-Chalmers equipment, delivers the water from the coagulating basin to the filters. Adjacent to it on the first floor of the filter building is a Dayton-Dowd 2,700-gpm pump with a 30-hp Westinghouse motor for the wash water for the filters. No air wash is used.

There are two filters built of concrete and measuring 17 feet 4 inches long, 12 feet wide, and 7 feet 6 inches deep. They have a capacity of 350 gallons per minute each, a combined capacity of 1,008,000 gallons per 24 hours. There are cast iron underdrains with 40 inches of graded gravel and 36 inches of sand. The sand lifts to within 6 inches of the top of the wash-water troughs during the washing period. The minimum wash is about 10 minutes. A Builders Iron Foundry rate-of-flow controller on each filter maintains a uniform rate of discharge of the filtered water. All valves for the plant are hand-operated.

From the filters the water flows directly to the open clear well, which has three transverse baffles to prevent short-circuiting and also gives some mixing action when lime is being added to the filtered water.

The raw, coagulated, settled water and the filtered water are regularly tested at the plant for pH, color, alkalinity and CO_2. No bacteriological tests are made at the plant, but the regular visits of the representatives of the State Health Department, at which time "bug" samples are taken, maintain a constant check on the operation of the plant. The filtered water and also the chlorinated water have shown negative results for many years.

The plant is operated about seven hours a day in summer and six hours in winter.

Elevated Steel Tank

The elevated steel tank is of steel construction and is located in Chickasaw. It has a capacity of 200,000 gallons and is mounted on a 118-foot steel tower. A 4-foot riser pipe provides both inlet and outlet for the water. The average pressure maintained in the system is 60 pounds. There is a 10-inch cast iron transmission main running from the tank to Prichard, supplying both that town and Plateau. The town of Whistler is supplied through an 8-inch transmission main from the elevated tank.

The plant is owned by the Tennessee Coal-Iron & Railroad Co. and is leased to the Alabama Water Service Co. for a period of years. The filtration plant was built by the water company. C. P. Rather is President and General Manager of the Alabama Water Service Co., with George H. Godwin, Division Manager, Prichard, Ala., in immediate charge of the Chickasaw plant.

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Skyline Highway Dedicated to Unemployed

By GEORGE M. YOCOM
Director of Parks and Public Property, Reading, Pa.

SINCE the early part of 1932, Reading Pa., and Berks County, of which this city is the county-seat, have been constructing, 1,000 feet above sea level, a scenic highway which has been compared to the famous Rim of the World Drive in California. When completed, Skyline Boulevard in Reading will be five miles in length. The first section, completed in July, 1932, called for an expenditure of $170,000, of which $100,000 was derived from a bond issue floated by the city of Reading for unemployment relief. Berks County contributed an additional $50,000 from its relief funds. The Boulevard was dedicated to the unemployed who built it.

TRUCK SPREADING ¾-INCH STONE AFTER APPLICATION OF THE PRIMARY SEAL COAT OF ASPHALT CEMENT

The second section of the boulevard was completed in July, 1933, and it is expected that the final link will be ready shortly.

An asphalt penetration macadam surface was selected for the entire project. Local mountain stone crushed to 3 to 4 inches was spread in place by the city, giving employment to 1,200 men. The men were divided into two groups of 600 each, the groups alternating with each other on a weekly basis. In this way a workman received $16 every other week.

The city also furnished rolling service, including a 3-wheel 10-ton roller, an operator for the machine, and the necessary materials for operating the roller. All other materials required for the project, in addition to labor and equipment, were provided by the contractor.

After the broken stone surface had been rolled to a depth of from 2½ to 3 inches, Texaco asphalt cement was applied by pressure distributor at the rate of 1½ gallons to the square yard. While the asphalt was still warm, ¾-inch stone chips were spread over the road at the rate of 50 pounds per square yard and rolled to fill the voids in the first course.

A second application or primary seal coat of the same asphalt cement was then applied at the rate of ½-gallon to the square yard and covered with 30 pounds of ½-inch crushed stone per square yard. The stone was then thoroughly rolled.

Finally, the surface was given a third application of asphaltic material. This time, however, an asphalt cutback was employed instead of the asphalt cement used in the first two treatments. One-third of a gallon of cutback was put on per square yard. The highway was then opened to traffic.

The Skyline Boulevard project was supervised by the Director of Parks and Public Property in Reading. The asphalt penetration macadam was contracted to the Windsor Service Co., of Reading, Pa. All engineering services were supplied by the city of Reading's own engineering staff. The construction and field supervision were under the jurisdiction of Harry F. Sullivan, who is still pushing work to a final completion, expected to take place early in the summer of 1935.

Planning Officials Organize

FORMATION of a new national organization in the planning field—the American Society of Planning Officials—was consummated last month. Its purposes are:

"To promote efficiency of public administration in land and community planning through the association of officials engaged in the making or administration of national, state, regional or local plans, by exchanging information, improving administrative standards and practices, engaging in research, publishing the results of studies, cooperating and collaborating with other public and private agencies and associations, and in all proper ways furthering the usefulness of public agencies in the field."

The constitution of the American Society of Planning Officials stipulates:

"Any person holding elective or appointive position upon a public planning body, or being an officer, executive, staff member, technician or consultant of a public planning body or occupying a public planning office, shall be eligible to active membership in the society. Only active members may hold office in the society or have voting rights. The term 'public planning body' shall be deemed to include any official board, commission, authority, or other governmental unit, department or agency, national, state, regional or local, engaged in land or community planning (whether existing under constitutional, statutory or charter authority or by designation of a competent governmental executive). . . .

"Any person having special knowledge, experience or interest in the field of land or community planning may be admitted to associate membership as determined by the Board of Directors."

The professional group in the fields of land and community planning—the American City Planning Institute—has voted to establish its headquarters at Cambridge, Mass., with Howard K. Menhinick, of the Harvard University School of City Planning, as Executive Secretary.

Some form of merger of the National Conference on City Planning and the American Civic Association is under discussion, but not yet consummated.

Municipal Cooperation Aids PWA's Program of Slum Clearance and Low-Rent Housing

By COLONEL HORATIO B. HACKETT
Director, Housing Division, Public Works Administration

THROUGH the cooperation of officials of municipal and civic bodies, the Public Works Administration has facilitated its low-rent and slum-clearance housing program.

Obviously, the Housing Division of the PWA is organized to handle adequately all problems incurred in its program, including planning, land acquisition, construction of projects and their final management. However, in many communities these steps are expedited through the assistance of local authorities. With few exceptions, the Housing Division has found local officials eager and enthusiastic to aid in carrying out successfully the low-rent housing program made possible by a PWA allotment of approximately $150,000,000.

To an extent this spirit of cooperation is responsible for the gratifying progress made on low-rent housing projects in more than thirty cities. Three limited dividend projects are now being tenanted. Three more are well under construction, and actual building operations will be launched on probably fifteen Federal projects this spring. Many slum areas have been razed, with others scheduled for demolition in the near future. In the low-rent housing program millions of man-hours of labor will be provided, not only in the building trades, but also in those industries producing and fabricating raw materials.

The rapid re-employment of more workers, the acceleration of the entire slum-elimination and low-rent housing program may be hastened by willingness of officials of those cities receiving allocations to give full cooperation to the PWA Housing Division. Preliminary social surveys and wisely considered city plans will aid in the initial work of selecting project sites. In the acquisition of land, in the razing of slums, and in the actual work of planning the new housing developments, there will be many problems whose solution may be expedited by cooperative efforts of city officials.

Schenectady's Unique Proposal

The city of Schenectady, which now has a proposal for a slum-clearance and modern housing improvement before the PWA, has prepared an interesting plan for civic expansion. Prepared after close and detailed study of problems peculiar to the community, it proposes to demolish all existing slums, to devote the razed areas to commercial and industrial uses, and to re-house slum-residents in modern buildings in new areas.

A survey of Schenectady buildings classed 2,750 structures as sub-standard, and of these 850 have been condemned as fire-hazards. Many of these buildings are located in the business and industrial section. The plan contemplates the purchase of new land above the business zone for new fireproof homes, and the utilization of the cleared property for a new wholesale market, new industrial and business buildings, and parking lots to relieve congestion on downtown streets. Thus this city has made low-rent housing and slum-elimination an integral part of a plan for a general civic improvement.

Preliminary Studies in Various Cities

Other cities have made valuable preliminary studies, which have been a boon in the consideration of project sites. Philadelphia, as an example, has a detailed survey of present buildings. A carefully executed map sets forth the physical or structural condition of every building in the city. In Cleveland and in other cities for which PWA projects have been announced, the site selection was based on intensive scientific studies of slum areas made by planning commissions or housing authorities.

Assistance from local officials has simplified the complicated task of land appraisal and acquisition in many projects. In Detroit, the local housing authority compiled a list of all mortgages held by closed banks, tabulated the amount due on each, and listed delinquent taxes for each parcel of land. In Louisville, city files which indicated appeals from tax-assessments were available to PWA representatives and proved valuable in negotiating for property embraced in the project site.

While much information sought is a matter of public record and accessible to PWA appraisers and land-negotiators, clerical assistance from local bodies has simplified routine in many cities.

Expediting Land Acquisition

Unofficial cooperation from city authorities has greatly aided in other cases. In one city, the purchase of a site was held up by demands of the owner of most of the land required for the project. He asked a price per square foot practically double that determined equitable by appraisers. Learning that negotiations were being impeded by his demands, city officials reminded him of the $25,000 he owed in delinquent taxes, and that they could take title to his property. The owner hastily offered to lower his price to a figure near that set by appraisers.

A similar difficulty was ironed out in like manner. Directors of a street-car line which ran through one PWA project had intimated they would ask $77,000 for the relocation of tracks. Considering the small cost of rerouting cars, engineers reported that the request was excessive. City officials intervened, and the street-car line made a formal offer to abandon its tracks for $15,000—one-fifth the sum originally contemplated. Under the PWA housing program costs are figured closely, and efforts of property owners to "hold up" the Government may result in the abandonment of a project.

To Get Rid of This Sort of Thing:

A typical section of the site of PWA's $2,700,000 Techwood slum-clearance and low-rent housing project in Atlanta. This picture was taken before the Housing Division went to work. Nearly all these dwellings were without plumbing

Typical alley scene on the site of the West Side slum-clearance and low-rent housing project in Chicago. Here PWA will spend $12,500,000 in cleaning out 37 square blocks, which will be replaced by good housing and parks and playgrounds

And to Build This Sort of Thing—
Are Major Aims of the Housing Division of PWA

How one section of the Techwood low-rent housing project in Atlanta will look when completed. Note the playgrounds and wading pool in the lower right corner. Rents in these attractive apartments will be on the same level as the slum dwellings they replace. PWA allotted $2,700,000 to this project

From many cities have come offers to expedite land-acquisition through exercise of the municipality's police power to condemn those properties which are considered health and fire hazards. Although the condition of literally thousands of buildings found in slum areas under consideration would warrant such action, the policy of PWA has been to decline these offers and attempt to obtain possession of the necessary land through amicable negotiations.

In every housing project aid from local officials has been expected in the closing of streets running through the area selected for rehabilitation. Willingly given in practically every instance, this type of cooperation has been greatly extended in several cities.

Helping with City Property

A most generous offer, which indicates a genuine intention by local authorities to obtain the greatest advantages from the PWA program, is that tentatively made by Cincinnati. So that a greater portion of the land selected for a PWA housing project may be utilized for building, the city proposes to expend $1,000,000 to eliminate a neighboring slum area and to improve the ground with recreational and park facilities, easy accessible to tenants of the project.

Detroit, eager to expand the opportunities provided by PWA allocations, proposes to turn over an unused strip of city property, included in the area selected for the improvement, to be used for housing operations. Soon the property may be acquired by PWA, its unsightly, abandoned warehouses razed, and replaced with modern housing accommodations within the means of Detroit's lower income families. The rental charged the Federal Government for use of the property will be $1 a year.

A new design for living. The view shows one of the courts in the Juniata housing project, constructed by the American Federation of Hosiery Workers in Philadelphia with a $1,039,000 PWA housing loan. The project will accommodate around 300 families in modern apartments. Note the swimming pool in the foreground. The first unit of the project was opened January 5

Before and after on a PWA slum-clearance and low-rent housing project, as the aerial camera and the architect see it. Above, slum conditions in Atlanta, Ga., which are being cleared out for the University project, for which PWA allotted $2,100,000. Below, architects' original models, suggesting how the completed project will appear

These few instances are typical of the gratifying spirit of cooperation demonstrated by officials in almost every city in which PWA projects are under way. As work on the widespread program progresses, new obstacles may be encountered, and in overcoming these Government housing executives anticipate a continuation of the gracious assistance already offered by municipalities.

Public Works Groups Join the P. A. C. H.

A POLICY of expanded service to members of the engineering and public works professions was announced January 12 by the American Society of Municipal Engineers and the International Association of Public Works Officials, upon the establishment in Chicago of a joint secretariat.

The secretariat will be administered by a joint board of four members from each organization. Members of the administrative board, as announced by Harrison P. Eddy, president of the municipal engineers, and Alfred E. Roche, head of the public works officials, are:

Thomas Buckley, Philadelphia, Charles M. Reppert, Pittsburgh, Guy Brown, St. Louis, and President Eddy, representing the A.M.E.; and William J. Galligan, Chicago, Mark B. Owen, Dearborn, Mich., J. E. Root, Cincinnati, and President Roche, representing the International Association of Public Works Officials. Donald C. Stone will be executive director of the joint organization. Headquarters will be at the Public Administration Clearing House, 850 East 50th Street, Chicago.

It was announced that funds have been granted the two organizations which enable them to make available to member municipal engineers and public works officials a clearing house of information on their current problems and to perform various other services to aid them in their profession of municipal service. Local, state and regional chapters to encourage cooperation of public works officials within an area will be fostered by the association.

The first joint annual conference of the members of the two societies will be held in Cincinnati next October.

Concrete in City Pavements

By H. F. CLEMMER
Engineer of Materials, District of Columbia

IN the development of design principles for concrete pavements during the past decade, the many large programs of research carried on by Federal and State Departments have dealt, particularly, with conditions pertaining to state and rural pavements. The same principles should be followed in the design of city streets, proper consideration being given to the difference in subgrade conditions and the nature of the traffic. Many factors such as grades and the width of streets make design and construction of municipal pavements a more difficult problem.

The Highway Department of the District of Columbia constructs a center 20-foot section following the thickened edge, center longitudinal contraction joint and mesh reinforcing principles, a design which is standard for many highway departments. The center slab provides for two 10-foot traffic lanes. The essential variance of the Washington design from the so-called standard is the additional variable width side slabs of 10-foot maximum width, and the curb and gutter sections, which, however, are used in the construction of many rural pavement systems. The side slabs provide for additional traffic lanes or may be used for parking purposes. Formed key-ways are constructed between the center 20-foot slab and the side slabs by clamping metal or wood "V" shapes to the sides of the road forms. Deformed tie bars, ½-inch round, 4 feet long, and spaced at 5-foot intervals, are placed across the center longitudinal contraction joint.

Owing to the non-uniform subgrade conditions encountered in the District of Columbia it is not logical to specify a slab of standard thickness. The thickness of the concrete and the amount of reinforcing are varied in accordance with the subgrade stability and the type of traffic to be carried.

Need of Expansion Joints

An important problem being given consideration at the present time in the design and construction of concrete pavements is that of providing for proper volume changes of the slab. Some engineers have considered it more economical to repair blow-ups that occur due to expansion during high temperatures than to properly provide for expansion of the concrete. However, consideration was not given to the fatigue effect resulting from repeated stresses set up by these expansive forces. When concrete is confined, variations in temperature and moisture cause stresses which are as effective in causing fatigue of concrete as repeated super-loads. Tests made to determine the effect of repeated loadings of pavement concrete show it to have an "elastic limit," or for concrete called "endurance limit," of about fifty per cent. Therefore, pavements should be designed so as to permit as full movement of the concrete as possible.

One type of expansion joint used in pavement construction in the District of Columbia is the metal air cushion type with an annealed copper seal 1 inch wide, bent in the form of an "M", having ¾-inch grooved flanges 1 inch from the top. These flanges bond with the concrete so that the joint is held in contact with the slab, to prevent the infiltration of foreign material. It is not necessary to maintain this type of joint with bituminous material; in fact, it is preferable not to pour the joint, inasmuch as pebbles which may lodge in the joint would be held in place by the asphalt and cause spalling of the edges of the slabs when expansion of the concrete takes place. The open joint also eliminates the unsightliness of extending filler. Dowel bars, ¾-inch round, 24 inches long, and spaced on 12-inch centers, are generally employed for transferring loads from one slab to another.

Cork material is also used for maintaining expansion joints. Open type joints are constructed into which compressed cork is placed, bituminous material having first been poured into the joint to seal the bottom. Inasmuch as cork which has been compressed fifty per cent requires ten or more minutes to expand to its original thickness, this material can be delivered to the project under compression and released just previous to placing in the open concrete joint. Placing the cork material in this manner insures satisfactory sealing of the joint under all temperature conditions.

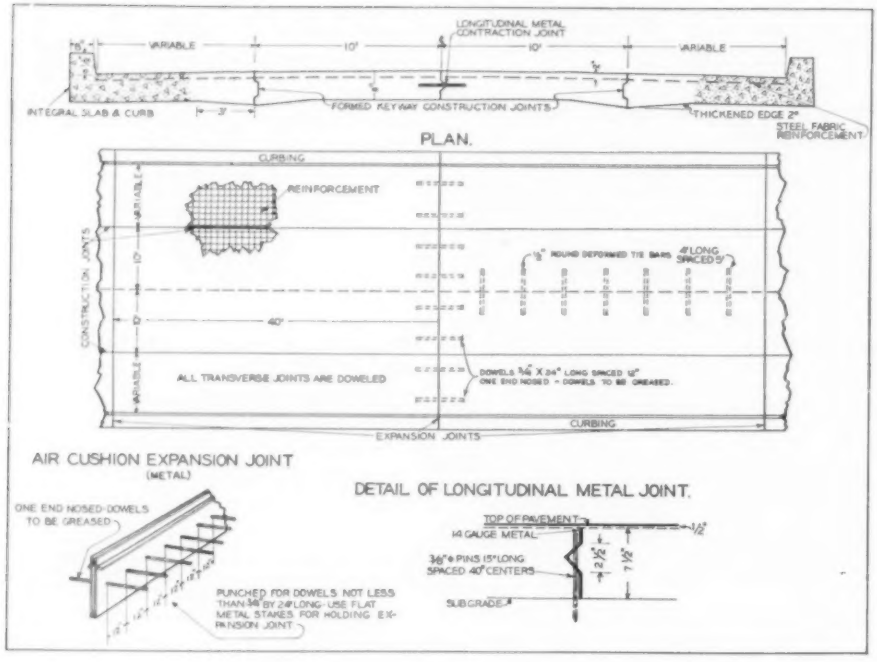
Concrete Bases

In order to control surface cracks on bituminous pavements and to provide for volume changes, weakened plane transverse contraction joints are placed, not more than 15 feet apart, in all base slabs. The general practice is to make a groove in the concrete at least 4 inches deep by pressing a layer of building paper into the concrete by means of a metal strip approximately 3/16-inch wide and extending the width of the slab. This groove is of course made prior to the initial set of the concrete. The metal strip is removed immediately after making the groove, while the layer of building paper is allowed to remain in the base slab. Athough the concrete is still in a plastic state after removal of the metal strip, the layer of building paper prevents the adjacent sides of the groove from binding, and during setting of the concrete provides for the formation of a crack the remainder of the depth of the slab.

The above practice is modified to some extent to allow for subsequent expansion when construction is carried on at temperatures below 50 degrees F. In such instances expansion joints, in addition to the weakened planes, are placed at the tangent points of intersecting streets and at a maximum interval of 300 feet; that is, should the distance between tangent points be more than 300 feet, expansion joints would be placed at the mid-point as well as at the tangent points of the intersecting street.

Owing to the close spacing of these planes of weakness, the movement of the individual sections is so small that cracks are not transmitted through the bituminous surface.

Other practices of minor importance, but of interest as to design and construction, are the brooming of concrete surfaces, the installation of reinforcing around manholes, and the construction of permanent traffic markers.



TYPICAL SECTION OF REINFORCED CONCRETE ROADWAY WITH INTEGRAL SLAB AND CURB

In finishing the concrete surface of pavements a street broom approximately one foot wide is pulled gently over the entire surface, perpendicular to the center line of the pavement, after the concrete has been straightedged and belted, but prior to the initial set. The depth of the broom corrugations does not exceed ⅛-inch. This method of finishing increases traction and improves appearance.

Cracks Around Manholes

It is believed that radial cracks around manholes and similar fixtures, which are present in all city streets, are caused by localized stresses set up during the hardening of the concrete. Light-weight wire mesh, chicken wire, is placed about 2 inches below the surface of the concrete for a space of 2 yards square around the fixture. The use of the wire mesh distributes the stresses due to shrinkage during setting of the cement and eliminates cracking. Examination of more than one hundred such installations, over a year after construction, did not show a single crack. Elimination of cracks often means elimination of ultimate pavement failures at such locations.

Permanent Traffic Markers

Permanent traffic markers are constructed both for concrete and bituminous pavements. In general, concrete composed of white portland cement, white sand, and standard coarse aggregate is used, the aggregates and cement being mixed in the same proportions as for pavement concrete. Black-colored concrete has been used with light-colored concrete pavements, but it is believed the white marker is more visible when the pavement surface is wet. The markers are placed in the center of the pavement, and in some instances to divide the surface into 10-foot traffic lanes. It has been found more economical to construct permanent traffic markers than to maintain painted traffic lanes.

From this discussion relating to design principles, it may be noted that the practices followed by the District of Columbia are in close agreement with the standard design principles employed by the larger highway units.

ACKNOWLEDGMENT.—From a paper presented before the Canadian Good Roads Association.

Adequate Housing Waits on Adequate Wages

THE problem we are discussing is one not merely of housing, but of fundamental economics. To the extent that private enterprise cannot or will not pay adequate and steady wages to workers, workers cannot live in houses that will pay adequate and steady profits to private enterprise. In other words, until private enterprise discovers how to make *prosperity* universal, it must welcome governmental aid in making *decent housing* universal.

When we achieve economic security for every American citizen, there will be well-paid jobs available for all employables, and pensions for the aged and incapable. Until that happy time seems assured, it may seriously be doubted whether what is optimistically called "home ownership" ought to be generally urged. Our wage-earners and home-makers need better assurance than they yet have that home ownership by mortgagers will not again become home ownership by mortgagees.

Economic security for wage-earners will increase economic security for wage-payers; and the economic security of home-owners will advance the economic security of home-builders. More adequate housing than America has ever had may thus be not only an important result, but a major cause, of more adequate prosperity than America has ever had.

—From "An Evaluation of the Government's Housing Program," by the Editor of THE AMERICAN CITY, at the annual convention of the American Association for the Advancement of Science, at Pittsburgh, December 31, 1935.

New Bedford, Massachusetts, Completes New Concrete Supply Line

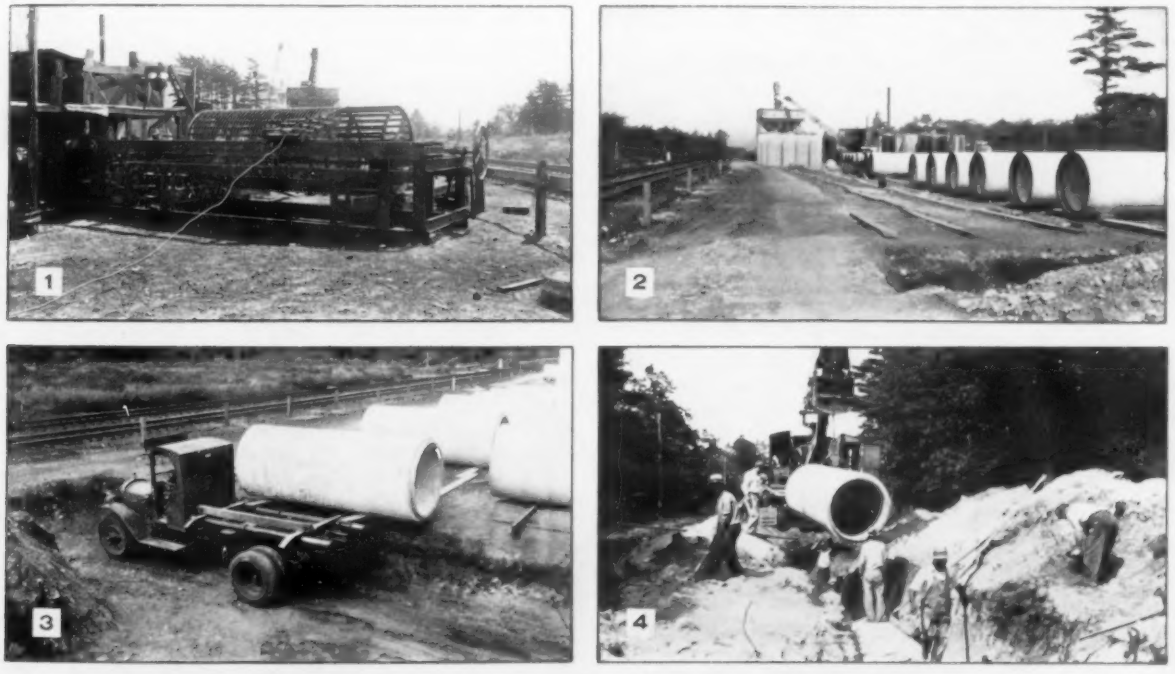
Four Miles Added to System Through PWA Project

THE vital part of the water system of New Bedford, Mass., which was constructed in the years 1896 to 1899, consisted of a 48-inch force main, 8 miles long. This main was made of riveted steel 5/16-inch thick, with telescopic joints, and was dip-coated with California asphalt. The line was put into service in July, 1899. Inspections from time to time have shown that some tuberculation has taken place and that the pipe is pitting under the tubercles. In 1921 an examination showed that the pitting was quite general, and in some cases halfway through the pipe. It was then decided that a second line should be laid about 25 feet from the original steel main and parallel to it in the same strip of land that had been purchased for the old line.

From time to time the Water Department has laid with its own forces a little over 4 miles of this new line, using 48-inch cast iron pipe. The necessity for the new line was not lack of capacity in the old line, but it was felt there should be a new line in readiness to replace the steel line before it failed. The work has recently been finished under contract with the Lock Joint Pipe Co., of Ampere, N. J., thereby completing this second line from the pumping station to High Hills Reservoir. The work was financed by bonds issued by the city and a 30 per cent grant under PWA. This method of financing was adopted because it was found that the city could borrow from outside sources at a better rate than from the Federal Government.

The new line is a force main through which water is pumped from the Quittacas Ponds to High Hill Reservoir, whence the city is supplied by gravity, so that no change in pressures in the city will result from the completion of the new line. It is expected that the old steel force main will be salvaged by lining it with cement or bitumastic compound when the new line is in service. This will give the city duplicate force main capacity.

The unit price on which the contract was awarded was $10.90 per foot of pipe furnished and installed, making a total contract price of $207,100.00 for the 19,000-foot line. Additional work and materials furnished by the city have brought the total cost of the job to about $250,000.00.



MANUFACTURING AND LAYING CONCRETE PIPE AT NEW BEDFORD, MASS.

1. The spiraling machine for making the reinforcing cage. 2. A general view of the pipe yard, with the plant in the background. 3. Loading a pipe on one of the special trucks for hauling to the trench. 4. Lowering a pipe into the trench

Manufacturing the Pipe in New Bedford

The Lock Joint Pipe Co. set up a plant for the manufacture of the pipe at Braley's Station, 8 miles from the center of New Bedford and approximately 500 feet from the end of the new pipe line. The plant was situated betwen two railroad sidings and completely equipped with the necessary machinery for fabrication of the reinforcing steel and pouring of the concrete.

The pipe was of the type known as steel cylinder reinforced concrete pressure pipe, with lead and steel expansion joints, furnished in 12-foot lengths of 48-inch inside diameter with 5-inch wall thickness. Each pipe consisted of a welded steel cylinder lined on the inside with concrete and covered on the outside with a heavy layer of concrete reinforced circumferentially and longitudinally with steel rods.

Each cylinder was made of four sheets of 14-gage steel with longitudinal seams. The sheets were curved in a roll and assembled into cylinders by means of riveting them temporarily to end assembly rings. The seams were formed by clamping the edges of adjoining sheets in a pneumatic press and electrically welding them by hand. When the four longitudinal seams were welded, the assembly rings were removed and galvanized steel bell-and-spigot rings were welded to the ends of the cylinder. The complete cylinders were placed in bulkheads and tested for strength and watertightness by an internal water pressure of 35 pounds per square inch.

The reinforcing cages were fabricated from coils of ½-inch diameter "hot rod" by means of a spiraling machine. In this machine the rod was first straightened, then curved to the proper radius and finally spiraled about a mandrel at a uniform spacing, all in one operation. When the end of each coil of rod was reached, it was electrically butt-welded to the next coil, and the weld was tested before being run into the spiraling machine. The spirals were placed on approximately 2.4-inch centers and fastened with wire ties to eight longitudinal rods of ½-inch diameter, which were also welded to the end spirals.

The finished cylinders were placed inside the reinforcing cages, then rolled to the casting yard, where they were set up with a collapsible steel form inside and an expansible steel form outside. All pipes were cast vertically and carefully hand tamped to give maximum density to the concrete, which was poured with a water cement ratio of 5.3. The forms were removed from the concrete the following morning, and the pipe were cured with saturated steam until the following day, when they were placed in the storage yard for seven days' air curing. Each pipe was marked with an identifying number and the date it was cast. During the storage period the galvanized steel bells and spigots were carefully cleaned to present a smooth joint for assembly in the field.

Hauling and Laying the Pipe

The pipe were hauled on heavy-duty trucks equipped with specially designed cradles. They were loaded at the storage yard by the driver and a helper, and unloaded at the trench by the same two men by means of skids and a rope snubbed around a steel pipe mounted on the truck.

The trench was excavated by a pull shovel, digging a distance sufficient to lay one pipe then laying a pipe length with the same machine before digging out for the next length. At the same time the pipe already laid were backfilled and tamped by hand labor to a depth one foot over the top of the pipe. The joints were calked from the inside of the pipe by a special crew. Pipe laying was done by two six-hour shifts. The whole time of the first shift and the first three hours of the second shift were spent in digging, laying and backfilling as above. During the last three hours of the second shift, the pull shovel went back over the line completing the backfill to a depth of 3 feet 6 inches over the top of the pipe, while the hand laborers finished the backfill on the last few lengths of pipe laid.

The contractor averaged twenty lengths of pipe per day. A maximum of thirty lengths were laid in six hours where the line passed through low fills which had been made ahead of laying, the trench being shallow and easily excavated.

This PWA project No. 2308 was completed by the Lock Joint Pipe Co. with L. G. Wilhelm as Superintendent. The company contracted for the installation of the pipe as well as its manufacture. The work was done under the direction of Stephen H. Taylor, Superintendent of the Water Department, with Howard Mandel, engineer, Frederick W. Anthony, inspector of pipe laying, and Carl Poulin, inspector of pipe manufacturing. Messrs. Taylor, Mandel and Anthony are permanent employees of the Water Department.

New Estimates of Governmental Debt

FOR 1932 the gross indebtedness of all governmental jurisdictions—Federal, state and local—in the United States amounted to $314.22 per capita. For the same year the per capita net governmental debt was $295.29. On the basis of the Federal figures for June 30, 1934, and the limited information available for state and local governments, the National Industrial Conference Board estimates the comparable per capitas for 1934 to be approximately $375 for gross debt and $340 for net debt. The increase in per capita gross debt since 1932 has been about 20 per cent, and the increase in per capita net debt about 15 per cent.

"Regardless of which figures are used for purposes of comparison, the per capita governmental debt of the United States," says the Conference Board's new report on 'Cost of Government, 1923-1934', "is well below that of either the United Kingdom or France. On the basis of the par of exchange prior to devaluation of the dollar, the per capita gross debt of the United Kingdom was $951.49 for 1932. The per capita gross debt of France for the same year was $466.53. The comparable figure for Germany, on the other hand, is only $94.88. Comparison of the German figure with those for the other countries is not particularly significant because of the effect of currency inflation on indebtedness outstanding prior to the establishment of the reichsmark as the monetary unit.

"The gross debt of all divisions of government in the United States is approximately $47,000,000,000. The gross debt of the Federal Government was $27,000,000,000 on June 30, 1934. The net Federal debt on June 30, 1934, was $24,800,000,000. Net debt is gross debt less the unencumbered Treasury balance. This balance has been unusually large in the last year. A large balance is regarded as essential in carrying out the program of the Adfministration.

"The net debt of state and local governments was $17,590,000,000 for 1932. The increase from 1922 to 1932 amounted to $8,900,000,000, or 102 per cent.

"For 1932 the per capita gross debt of all governments—Federal, state and local—was $314.22, and per capita net debt amounted to $295.29. Comparable figures for 1934 are about $375 and $340, respectively."

Premixed Oil Paving in La Junta

E. R. A. Labor Prepares and Lays Popular Paving

By GEORGE E. HINE
City Engineer, La Junta, Colo.

LA JUNTA is a city of 7,200 population, situated in the upper Arkansas Valley, halfway between the eastern border of Colorado and the Rocky Mountains. The name is Spanish and means "the Junction." U. S. Highway 50 passes through the main street of the city to the west side, where U. S. 350 to the southwest, state highway 10 to the west, and U. S. 50 to the northwest, come together.

The city has 40 miles of streets, 2½ of which are paved with concrete, and 3 miles are now oiled. The remainder has been graded and surfaced with either sand or limestone shale. Owing to heavy traffic and light rainfall, the dust menace has become more serious each year; sprinkling has been of little value, drying up in a few minutes after the sprinkler has passed over a street.

Oil Paving Gains in Popularity

A petition for oiling one street was circulated successfully in the spring of 1934. A majority of the frontage was signed up, with the understanding that the assessment was not to exceed $25 for a 50-foot frontage, and the work was to be similar to that in Colorado Springs and Denver. Petitions have now been filed for 120 blocks of street oiling, and 45 blocks of the oiling have been completed.

The work of oil paving began in August, 1934, and has continued up to the present time. The intersections were high and it was necessary that they be graded down, the excess materials being trucked away or used in parts of the street that were too low. The city sprinkler is used to soak down the loose material, and the maintainer keeps them smooth until traffic irons out a smooth, hard surface. Where curb and gutter have been constructed, a depth of 1½ inches of roadway is cut away at the edge of the gutter to bring the full depth of oil paving against the concrete. Where there is no concrete gutter, a shallow trench is cut at the edge of the roadway to give an extra depth to prevent raveling and breaking away.

The Oil

Oil of 65 to 75 per cent asphalt content to meet the specifications of the city and county of Denver has been purchased from the Standard Oil Co. of Indiana at 6.8 cents per gallon delivered at La Junta. This oil has averaged an asphaltic content of 73 per cent. The car is set on the Santa Fé tracks, adjacent to the city street. The street and available land along the tracks give room for a mixing site. Steam is connected from the Santa Fé Railway lines for heating, and air lines are attached for pressure in elevating the oil to the mixer.

Early in December a second-hand tank from an oil car was purchased for $150 from the Santa Fé Railway. This tank has a capacity of 9,500 gallons and is now set up at the site of work, as a storage tank. A 120-gallon steel tank and coils were also purchased from the Santa Fé Railway at a cost of $15. All these are connected up and the oil will be heated in the auxiliary tank only as used.

Batching the Aggregate

Measuring boxes holding 2 cubic feet are used, with two men to a box. Each batch contains 12 cubic feet of aggregate at 105 pounds per cubic foot. The aggregate used is the waste or fines from crushing granite and quartz pit-run gravel for Federal paving projects. This material costs 10 cents per cubic yard at the dump. It is trucked six miles over paved highway at an additional cost of 25 cents per cubic yard for the use of E. R. A. trucks, and consists of the following:

Passing a ¾" screen	100%
Passing a ½" screen	88%
Passing a ¼" screen	74%
Passing a No. 10 mesh screen	52%
Passing a No. 40 mesh screen	17%
Passing a No. 80 mesh screen	13%
Passing a No. 200 mesh screen	8%

Owing to the lack of fine material 13 per cent by weight, or 2 cubic feet, of fine blow sand is added to make up the deficiency. This seems to be sufficient to compact the bituminous surface. Nine and three-fourths gallons of oil are used to each batch of 14 cubic feet of material. A two-minute mix is sufficient, providing the oil is hot and additional heat in the drum is used.

Mixing

A 14-cubic-foot mixer is rented from a local contractor at $1.50 per hour for time actually used. An average of 40 hours is required to use an 8,000-gallon car; this includes approximately 6,300 gallons in the mix and 1,700 gallons for the base coat, which is sprayed on the street surface. A natural gas jet is used in the mixer drum during cold weather to prevent the formation of lumps of fine material and oil.

Preparing the Street and Spreading the Mix

The prepared street surface is swept by hand with push brooms and is then sprayed with 1/5-gallon of oil per square yard. The sprayer is homemade. An asphalt heater holding 100 gallons has been attached to a double-acting hand pump and air tank. Six water sprays are used to spray the hot oil. A strip 6 feet wide is sprayed on at one time. The sprays are attached in pairs, and any set can be used separately in finishing narrow strips. This spray has given the best of satisfaction.

Two city dump-trucks haul the oil mix, which is spread by the trucks in warm weather. In cool weather the mix is first spread by hand, working back over the base coat in order to keep the base intact. One and one-half inches

of the loose material is placed on the street. A Caterpillar one-man maintainer moves the mix back and forth several times and then gives the finishing blading. Traffic soon makes a smooth surface. In order that the edges may be made compact first, trestles or other obstructions are placed in the center of the street for several days.

Cross streets are oil-paved along with the main streets, the $25 assessment on the main street for each 50-foot frontage taking care of the cross streets. Thus actually only one-half of the frontage is assessed. One 8,000-gallon car covers six blocks of 300 feet each, including intersections. The assessment of $300 per block for three blocks gives $900 revenue, which is approximately distributed, as follows:

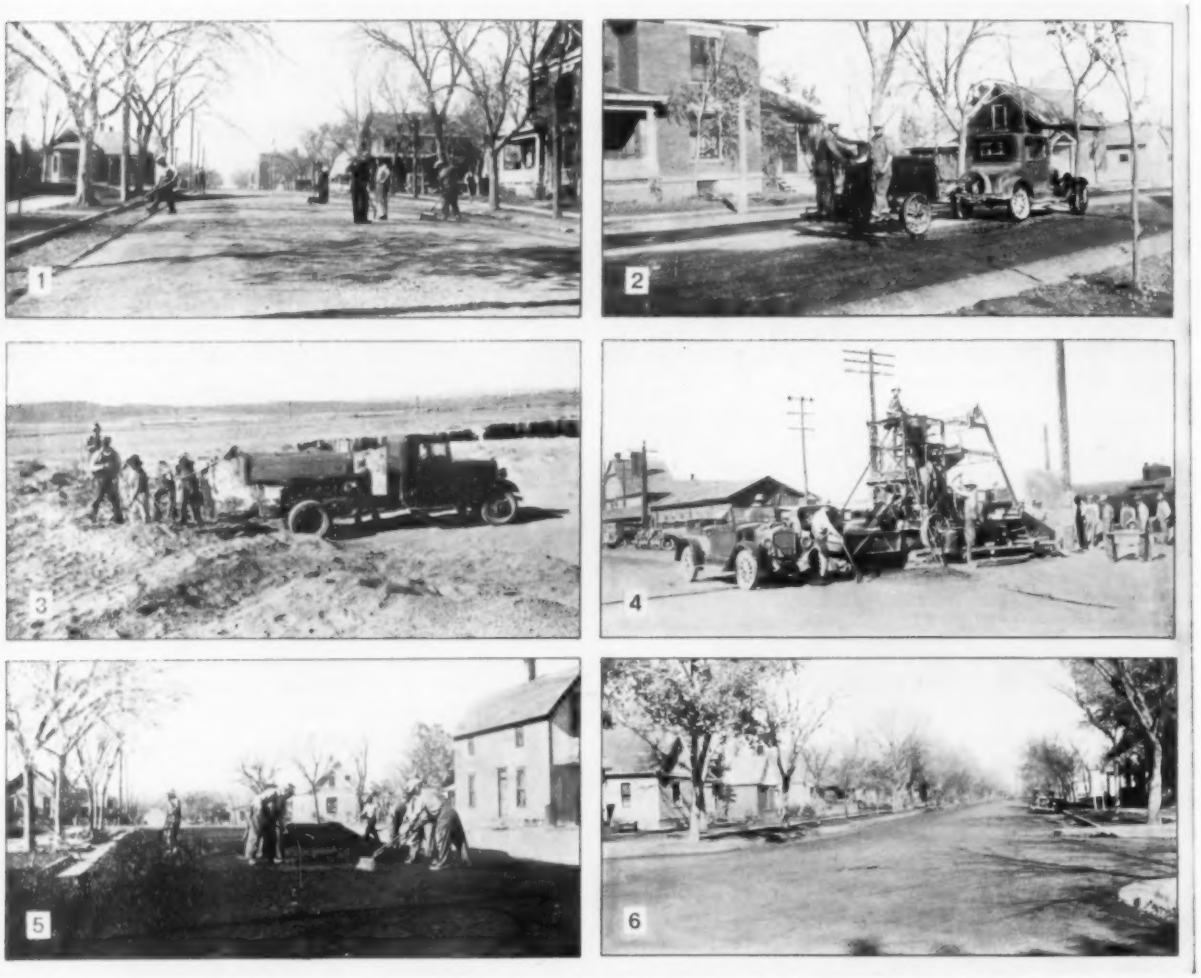
8,000 gals. of oil at 6.8c	$544.00
350 cu. yds. sand at 35c	122.50
Steam for heating	70.00
Use of concrete mixer	60.00
Mixer operator	30.00
Allow for extra labor and incidentals	73.50
Total	$900.00

The city does not make any charge for its regular help or equipment, receiving in return for the use of its equipment and labor the oiling of the intersections and alley crossings. Approximately 8,500 square yards are oiled with an 8,000-gallon car, using 0.94-gallon per square yard. The cost to the property owner is 10.6 cents per square yard.

Payment of Assessments

The assessments are made up and property owners notified immediately following the completion of the work on each street. Assessments are usually made in one payment, but partial payments are allowed to be made at any time. All assessments that become delinquent are certified to the County Treasurer and are a lien against the property and are collected the same as other delinquent improvement assessments. Owing to the small assessment of 50 cents per front foot, little difficulty has been encountered in making collections.

The work that has been done has proved very satisfactory to the public. Petitions for additional oil paving are being circulated and signed up with little opposition. With the experience gained thus far, the work should be rapidly pushed forward during the coming spring and summer months.



METHODS AND RESULTS OF PAVING WITH AN OIL-MIX IN LA JUNTA, COLO.

1. E.R.A. labor on final preparation of a street for oil paving. 2. An inexpensive method of applying the tack coat of oil on the prepared base. 3. Hand loading crusher waste for aggregate. 4. The rented mixing plant. 5. Spreading the oil mix by hand. 6. Roton Avenue, recently completely paved with oil mix

Civic Atmosphere and City Air

Urban Amenities Gain Effective Impetus from Modern Industrial Skill

By DR. EDWARD R. WEIDLEIN
Director, Mellon Institute of Industrial Research

A CIVIC atmosphere favorable to city beautification is being evolved in industrial centers. This trend is finding its most notable expression in relatively recent products of industrial skill, products such as highly reflective, bright metals and alloys, and enameled and lacquered household and commercial equipment.

The distinctive note of these things is a combination of the qualities of glossiness, smoothness, and cleanliness. It seems logical to expect that the creation, manufacture and increasingly wide marketing of these products will tend more and more to set a changed standard of public taste. Indeed, the change is already manifest in the gloss of our automobiles; in the shininess of most modern kitchens and restaurants; in the aluminum and stainless steel trim of buildings; in modern store fronts and metallic letterings; and in art objects without number. Here and there the new note is struggling to express itself in residential architecture.

The New Form of Beautification

If we may believe our eyes, the indication seems clear that we are to get an effective impetus for city beautification from and by grace of the perfection of machine production. We first expected the machine to give us utility. Then we asked that attention be paid to artistry in form. Now we are demanding emphasis on highly polished surface and lavishness in color, in addition to form and utility. The response is apparent in many modern creations which are winning popular favor.

The movement now well under way will challenge the old as it never before has been challenged. To what lengths this movement will penetrate into our daily living conditions no one can say. But there is no doubt that the new form of beautification will require cleanliness, strong light, and complete freedom in the use of color. We should probably be prepared to see control of noise and vibration added to the other amenities of the new age.

Our current task would appear to be that of reconciling the new with the best of the old, so that no values are lost in the period of transition. If we will bow to facts, and accept them and use them, no difficulties need be raised. The outstanding contribution of our generation is its development and compilation of facts useful to us in our every-day life. They give us the basis for verification such as no previous people ever possessed. They underlie and validate the machine age; they are pressing for recognition and acceptance in every phase of human activity. Escape from them is probably neither possible nor prudent. These facts indicate that we shall see a restoration of original, naturally true, and humanly vital rural conditions conferred on urban life. This implies, perhaps, that the city of tomorrow will in its outward aspects tend to reproduce the best of the country and that, in turn, the country will tend vastly more to resemble the city. Indeed, the conditions that favor the one are equally favorable to the other.

As a means of gaining a true perspective of industrial centers, an approach by way of economic history may be helpful. From the day of their founding, they have been the scene of struggles between conflicting forces. On the one hand has been manifested constant desire to conserve and even to enhance the beauty of natural resources. On the other hand has been the steady burden of stern necessity for making practical use of raw materials, including the burning of coal with which to power industries and to heat and light buildings.

If, in the past, industrial centers have over-emphasized their immediate needs at the expense of satisfying a craving for beauty, it by no means follows that they have established binding precedents. The arrangements devised for carrying on life in cities only appear to be static. In the case of older industrial communities the rate of change in form and practices may be slower, but it is none the less sure.

In the long run it will be found that communities are only temporizing when, among other things, they pollute streams, or when they erect cities on patterns that fail to utilize sunlight hygienically, or when they try to convert outdoor urban air space into an unreliable sewage disposal system, or when they permit noise in unnecessary volume.

"Nature Has Not Run Out on Man"

Practices of this kind have been common to the development of many cities and constitute impairments of an atmosphere for city beauty. But upon broad analysis the developments are found not to warrant pessimism. It is well to remember that man sometimes has run out on nature, but that nature has not run out on man. The quality and volume of vital solar radiation remains unaltered at the source by anything that has been done in any city. The rain that falls in the mountains is just as pure as when those mountains first raised their heads. The headwaters of our streams continue to be as clear as ever. The air supply available in our vast open spaces has all its original purity.

Attention is directed to these things at this time to show that, while city dwellers may have abused or misapplied or disfigured some of their resources, they have not actually lost or destroyed a single natural element essential to the restoration of an atmosphere for city beautification. Nature's storehouse is as abundantly stocked as ever.

We cannot confine considerations of beauty to inventions and improvements alone, or even to a question of continued additions to the comforts and conveniences of life. These things would be but secondary in value—of no more importance than better surroundings and quarters for farm animals—unless it can be shown that they are in basic conformity with naturally defined human needs and represent valid contributions to sound cultural standards. Clear

agreement on this point will help to inspire confidence requisite to cooperative action in the days that lie ahead.

Restoring Urban Air to Healthful Purity

On the basis of this general showing of our power and desire to progress in city beautification, it is proper to make one or two specific references to problems that fall within the field cultivated by Mellon Institute. In particular, value attaches to an investigation of the quality of urban air supply and the efforts that have been made toward restoring it to a condition of healthful purity.

It is hardly necessary to recall conditions of some decades ago when billowing smoke earned titles for various industrial centers. Nor is there need to explain that with the combustion processes then in use smoke production could not be avoided. Scientific knowledge in many subjects was limited and incomplete. There was unawareness of the full extent to which the smoke curve was an index of the health curve respecting some diseases. There existed no reliable measure of the intensity with which some components of the chimney stream attack stone, metals, painted surfaces, leather, fabrics, and other materials. Citizens realized that they were excluding much sunlight, but they had not discovered that the smoke pall often was cutting out practically all the ultra-violet band in the solar spectrum and thereby inviting rickets and other diseases to affect public health. Manufacturers did not know that some of the dust they were creating was in particles so small as to be invisible and that these particles actually were penetrating recesses of the respiratory tract, tending to produce more or less dangerous irritational effects and to predispose to serious complaints.

It is probably correct to say that appreciation of what smoke was doing to people and their property came at about the time of the investigation into Pittsburgh air pollution, carried out by Mellon Institute in 1912-14. On the basis of comprehensive reports of such research, programs for gradual abatement of smoke were adopted by many cities. Partial control over industrial, railroad, commercial, and apartment house smoke was established. Some supplemental surveys have been conducted at various points.

About twelve years ago the carrying forward of smoke and dust control in Pittsburgh was put in the capable hands of H. B. Meller, who in these years has also remained as head of the air pollution investigation at Mellon Institute and has supervised several pieces of important research. Under his direction, and often at his suggestion and by his assistance, processed fuels and improved equipment have been adopted by thousands of consumers. There have been similar developments in other cities, notably Boston, Cleveland, Cincinnati, Chicago, and Hudson County, N. J.

While this progress has been gradual, gains have been retained and the effect is cumulative. The last sootfall survey revealed that, in less than twenty years, the blacks in Pittsburgh smoke had been reduced by 80 per cent, and that most large consumers of fuel could easily comply with stricter anti-smoke regulations. Other large communities can point to comparable progress.

As the process of taking the contaminants out of urban air is continued in accordance with a sound and successful program, we may expect to deal with other elements essential to an atmosphere for city beautification. If we find here and there concentrations of acid gases or of finely divided dusts which might hamper sound and desirable civic growth, unquestionably we shall be able to bring them under satisfactory control. Practical methods for such control are being tested.

Of interest in this connection is the research in progress at the University of Pittsburgh to determine just what species of trees and shrubs are most resistant to the atmosphere of a large city. Nurseymen have a rough idea of what species of plant now in cultivation can best be planted in such areas. But to date practically nothing has been done which would aid either the horticulturalist or the layman in acquiring new species, ones as yet untried, which would flourish under such conditions. With New York planning for a million new trees on its streets, research in vegetation can assist to success.

The conditioning of the air in buildings will serve to emphasize the pleasure and healthfulness of pure outdoor air. Likewise, the diminution of street noise that will come with extended use of rubber in lighter-weight transportation vehicles will have a tendency to make for less noise from other urban sources.

Assuredly we are living in a most engaging period of urban history, and it will be interesting to see what communities do with the rich combination of machine-age trends and vast natural resources. American industrial cities may develop a world-pattern for urban civilization.

Radio Series on "The 44 State Legislatures of 1935"

THE new series of "You and Your Government" broadcasts, on Tuesday evenings, February 5-June 11, will be given from 7:45 to 8:00 Eastern Standard Time, over an NBC-WEAF network. The February-March-April schedule follows:

February 5—The One-House Legislature
Senator George W. Norris, Nebraska

February 12—"Government by the People"
Hon. John G. Winant, former Governor of New Hampshire.

February 19—Simplification of Local Government
Hon. Seabury C. Mastick, Chairman, New York State Commission for the Revision of the Tax Laws
Howard P. Jones, Secretary, National Municipal League

February 26—How Can The Legislatures Help the Police?
Chief Andrew J. Kavanaugh, First Vice-President, International Association of Chiefs of Police
Donald C. Stone, Director, Consulting and Research Division, Public Administration Service

March 5—Providing a Liquid Market for Home Mortgages
James A. Moffett, Federal Housing Administrator

March 12—Financing Emergency Relief
Arch Mandel, Field Representative, FERA
Frederick I. Daniels, Executive Director, New York State TERA

March 19—Liquor Laws and Enforcement
Hon. Edward P. Mulrooney, Chairman, New York State Alcoholic Beverage Control Board

March 26—The Public's Responsibility for Legislation
President Harold W. Dodds, Princeton University

April 2—Interstate Cooperation in Combating Crime
Raymond Moley, Editor, *Today*

April 9—Solving Local Tax Problems
Governor Harold G. Hoffman, New Jersey

April 16—Tax Limitations
Professor Simeon E. Leland, University of Chicago

April 23—Social Insurance
Governor Philip F. LaFollette, Wisconsin

April 30—Overhauling Criminal Procedure
William Draper Lewis, Director, American Law Institute

The Snow-Plow Again Fights Man's Battle

Marooned Travelers Released, Paralyzed Business Restored and Doctors Enabled to Reach Patients

WHEN an icy high wind from Alberta and moisture-laden winds from the south meet in the snow belt, a heavy fall of snow will inevitably result. If heavy winds accompany the snowfall, drifts are quickly piled up on highways, roads and city streets, paralyzing the motorized traffic of today. Our grandparents, or even our parents, would have pulled out the old sleigh or pung and with a few uncomplimentary remarks about the weather would have gone about their business. Today, we rely so generally on individual motor transportation, which requires clear highways, that snow removal becomes of paramount importance as a maintenance item. Although heavy snowfalls disrupt motor traffic, the big V-plows quickly push aside the drifts, the rotaries get in their work in the cuts, the roads are finally cleared with the blade plows, and our arteries of commerce are again free.

From the high mountains of California, where motor parties are frequently trapped in winter by sudden snowstorms, through the Rocky Mountain area near Denver, where similar occurrences take place, across the Great Plains and into New York State in the east, the snow-plow is man's instrument for fighting winter's threat to our highway transportation system. When motor transportation is paralyzed in suburban and rural communities, business is at a complete standstill. We have not forgotten the cartoons which appeared in February, 1920, throughout the country, portraying Father Knickerbocker with icicles extending from his fingers, looking down at street cars helpless in snowdrifts in New York City.

Winter seems to be returning to its own in spite of the learned discussions of Gulf Stream changes and Labrador currents heading for mid-Atlantic instead of coming down the coast of Maine. Those towns, counties and cities which have maintained their snow-plow fleet at the peak of efficiency will be in a position to keep the roads open for the local doctors, for the salesmen or the farmers coming to town for supplies, as well as making it possible for the traveler relying on automotive power to make his way safely from town to town and through those towns expeditiously.

Blizzard Maroons 150 Travelers

Snowplows Finally Release Four-Mile Line of Buses and Trucks in Mohawk Valley.

LITTLE FALLS, N. Y., Jan. 2 (A. P.).—Snowplows freed a four-mile line of buses, trucks and automobiles from the snowdrifts that mounted to 10 and 12-foot heights, just east of here today. In the line were four buses, carrying perhaps 150 passengers. One of those vehicles, with sixty aboard, had been s... since 11 o'clock last night.

A dozen miles north ... in the vicinity of the stalled where four men we... drifted at points to a three nights in a wre... feet. In this area until rescuers reach... keeps across day. ... still

The worst blizzard ... down the valley last ... the highway, the ... route between Buf... Mrs. Ruben Klo... house many of ... Mohawk Valley ... warmth, said ... bound from N... toward Buff... persons.

Snow Plow Clears Path to Hospital

HAMILTON, N. Y., Jan. 2 (A. P.).—Miss Katherine Betts, 16 years old, was in St. Elizabeth's Hospital in Utica today after a village snowplow had cleared the way for her trip when an emergency operation for appendicitis was ordered. The girl was stricken ... traffic in ... deep ... storm ...

CLIPPING FROM NEW YORK SUN OF JANUARY 2, 1935

Tax Collections for 1934 Estimated at $9,500,000,000

TAX collections in the United States reached an all-time peak of $10,266,000 in 1930. For 1932, total collections were $8,147,000, or 21 per cent less than for 1930. There was little change in the total from 1932 to 1933. Total tax collections for 1934 were estimated at $9,500,000,000. Federal tax collections for the fiscal year 1934 were $1,106,000 larger than for 1933.

These are the estimates of the National Industrial Conference Board in its new report on Cost of Government, published last month. Discussing the figures, the report says:

"There is a tendency on the part of the public to assume that there is a more or less direct correspondence from year to year between total tax collections and governmental expenditures. Not infrequently it is stated that tax collections in the United States are $13,000,000,000 or more. In assuming that tax collections are roughly comparable with governmental expenditures, two important facts are disregarded. The first is that each year the non-tax receipts of government amount to a substantial sum. These include, among other items, special assessments, fines, subventions and grants or payments by one division of government to another, rents and interest, and earnings of general departments and public service enterprises. For 1932 non-tax revenue receipts of state and local governments were almost $2,500,000, and for the same year the Federal Government reported $232,000,000 in miscellaneous receipts. In order to arrive at a net total for all governments, duplications resulting from subventions and grants, which consist primarily of Federal-aid and state-aid payments, must be eliminated. When allowance is made for these duplications, the net total for non-tax receipts was approximately $1,900,000 for 1932. This amount, it should be added, does not include any receipts from borrowing.

"The second fact is that not all expenditures are financed directly out of current income. Borrowing on a long-term basis for capital outlays is an accepted feature of state and municipal finance. In a period when debt is increasing, expenditures tend to exceed current income by the amount by which debt is increased. In addition, current operating deficits, or the excess of expenditures for operation and maintenance and interest over the income available for these purposes, tend to widen the margin between income and outgo. In normal times operating deficits are usually reflected in short-term indebtedness, but under conditions of depression they may affect long-term debt as well. The deficit financing of the Federal Government, for example, has affected the volume of all forms of Federal debt outstanding."

Paris, Kentucky, Builds a Profitable Electric Plant Against Odds

By HARRY J. ACHEE
General Superintendent,
Water and Electric Departments

PARIS, KY., 6,210 population, put its new municipal electric plant in operation in November, 1933, and for the month of March, 1934, made an operating profit of $2,400; $15,000 for the first six months. This is an average of $2,500. The profit in November was $5,000, and for the year $34,000. Fixed charges, in addition to operating expense, amounts to $714 for interest and $535.25 for depreciation.

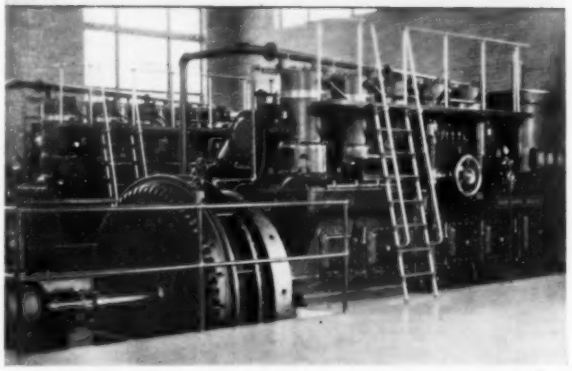
The city had been dissatisfied with poor service and high rates for both water and power, and for twenty years had vainly sought relief. In order to obtain action through powers which the state confers on commission cities, Paris changed from the council to the commission form and in January, 1930, began functioning with a mayor and four commissioners.

The water company immediately petitioned the Board for a new franchise under rates that were deemed excessive. Consequently it was decided to issue mortgage bonds to purchase the water system, which was inadequate and defective. The city took possession in April, 1931, and rebuilt the entire system, completing the work in 1932. The income under reduced rates more than paid for interest and amortization. The water plant was described in THE AMERICAN CITY in October, 1932.

In 1930 the people voted 2,229 to 180 for a $150,000 bond issue to pay for building a municipal electric plant and distribution system, and in 1932, after the water system had been rebuilt, an ordinance was passed for the issuance of the bonds. Then the private utility reduced rates a total of $20,000 per year, but the city proceeded with its plans, despite a mandamus action and an injunction against the validity of the bond issue later declared valid by the courts. The utility attempted unsuccessfully to prove that water bonds amounting to $425,000 and the interest thereon were a direct obligation on the city and that therefore the light bonds would constitute an issue in excess of the legal limitations of the city, whereas the water bonds were payable as to both principal and interest out of earnings only. An ordinance has since been passed making both the interest and the maturity charges a first obligation on the earnings of the electric plant. It is expected that all bonds will be so retired, and the earnings already justify this expectation.

Litigation settled, the bonds were sold and bids were taken on the equipment. It was decided to combine the electric plant and the water plant on a site on Stoner Creek, half a mile from the town.

The Commissioners decided on diesel engines and awarded the contract to Fairbanks, Morse & Co. The private utility brought an injunction suit against the contract but, since it declined to post bond to make the injunction permanent, the suit was thrown out of court, and the plant was carried to completion in November, 1933.



EXTERIOR OF THE PARIS PLANT; AND THE DIESELS

"The plant itself is a model of up-to-date equipment," says its General Superintendent. The two 525-hp diesels are equipped with governors by Massey Machine Co., Watertown, N. Y.; force feed lubricator to power cylinder, by Madison-Kipp Corp., Madison, Wis.; lubricating circulating pump by George D. Roper Corp., Rockford, Ill.; fuel-oil meters by Buffalo Meter Co., Buffalo, N. Y.; exhaust pyrometers by Illinois Testing Laboratories, Inc., Chicago.

Fuel-storage tank for 20,670 gallons by Adamson Co., East Palestine, Ohio; fuel-oil strainer by Zenith-Detroit Corp., Detroit; fuel-unloading rotary oil pump by Roper. The electric motors of the oil pumps have push-button-control automatic starters by Allen-Bradley Co., Milwaukee; fuel-oil meter by National Meter Co., Brooklyn, N. Y.

Current for the plant auxiliaries is stepped down from 2,300 volts to 230-115 by three 25-kva transformers of Maloney Electric Co., St. Louis.

The 8 x 10-foot switchboard controls the entire plant. The panels of ebony asbestos are 1½-inch. The potential transformers are Y-connected, Wagner Electric Co., St. Louis. Current transformers by Duncan Electric Manufacturing Co., Lafayette, Ind. The a-c automatic voltage regulators are by Allis-Chalmers Manufacturing Co., Milwaukee; oil circuit breakers by Roller-Smith Co., New York; high-voltage disconnecting switches by Ward-Leonard Electric Co., Mount Vernon, N. Y.; a-c recording voltmeter by The Bristol Co., Waterbury, Conn. Meters on feeder panels include Weston frequency meter, ammeter, 5,000-volt a-c voltmeter, and Duncan watthourmeter; on generator panels, Weston d-c field ammeter, indicating kilowatt meter.

The Plant Layout

The two full diesels (5 cylinders, 14x17-inch, 525-hp., 2 cycles, 300 rpm, model 33-D-14, mechanical injection of fuel) are direct-connected to Fairbanks, Morse alternators, 365.5 kw at 80 power factor, 3-phase, 4-wire, 60 cycles, direct-connected to an exciter of 13 kw, 125 volts.

The fuel oil is special diesel-engine oil of 32-36 deg. B. gravity, cherry color, by the Shell Refining Co. The lubricating oil is Algol medium of the Texas Company. The plant has been operating one year on these oils, and

excellent results have been obtained. The Algol is kept clean by a washing machine planned by the writer.

The switchboard runs flush with the inside wall, and all switches and high-voltage equipment are located 8 feet back of it in an alcove housing only the electrical equipment and switchboard. Auxiliaries are located in the basement and are controlled by push-buttons with pilot lights on the instrument panel in the main engine room. All piping is welded. The silencers are fabricated to Fairbanks, Morse & Co. design and have eliminated all objectionable exhaust noise.

The reinforced-concrete 6,000-gallon hot-well is in the basement, with a manhole opening into the engine-room floor. All pumps—raw- and soft-water circulating, oil-transfer and lubricating-oil circulating pumps—are so installed as to have a positive suction head to eliminate all necessity of priming. Heat changers are assembled in a vertical position at the end of the engine foundation, and installed so that the nest of tubes may be withdrawn by a traveling crane, for cleaning, through openings in the main floor. The plant is compact and pleasing in appearance.

The private company dropped the top block to 7 cents, eliminated the deposit on the meter and made other concessions to hold its customers. The city is charging the same rates, given at the end of this article, and the municipal plant is carrying 75 per cent of the total load. In fact, the demand necessitated the installation of a third unit, now in operation. It, too, is a product of Fairbanks, Morse & Co., 1,050 hp, vertical, single-acting, solid mechanical injection, 300 rpm, 2 cycles, 6 cylinders, 33 D-16, direct-connected to a generator rated 731 kw at 80 power factor, equipped with a Woodward hydraulic governor, and excited by a 17-kw motor generator. The cost complete was $69,463, paid for by revenue certificates to be retired by earnings in five years. This unit doubles the capacity of the plant, bringing it to 2,100 hp. The plant equipment is carried in the annual report at $225,130.

The continuous supply of cooling water and oil in the circulating systems are protected by electric alarm systems that sound in the event of failure of pressure. The oil circuit breakers also are equipped with electric alarms.

The electric and water plants are administered by a Board of Public Utilities consisting of six men (E. H. Gorey, Chairman; Barnett Winters, Secretary). The City Manager is Boone Baldwin; the Mayor, George L. Doyle.

1934	Total Revenue	Total Operating Expense	Operating Profit
Jan.	$5,300	$1,966	$3,334
Feb.	5,278	2,070	3,230
March	4,713	2,302	2,411
April	4,710	2,151	2,558
May	5,118	2,103	3,015
June	5,025	2,112	2,913
July	5,062	2,540	2,521
Aug.	5,501	2,461	3,034
Sept.	5,345	2,466	2,878
Oct.	5,309	2,410	2,988
Nov.	5,626	2,329	3,297
Dec.	5,429	2,757	2,491
	$62,516	$27,667	$34,670

Residential lighting rates:
First 12 kwh for $1 minimum charge
Next 18 kwh at 7c per kwh
Next 20 kwh at 5c per kwh
All over 50 kwh at 3c per kwh

Optional rate for electric stove and water heating:
First 30 kwh for $2.50 minimum charge
Next 100 kwh at 4c per kwh
All over 130 kwh at 2
1c per kwh for water heating for off peak load demand

Water rates:
3,000 gallons for $1.50 minimum charge

Let Us Build Some Garden Cities

To the Editor of THE AMERICAN CITY:

To one who has for fifteen years studied in this country and abroad the problems of city building and housing, and who has pondered the prospects for sensible solutions of these problems in the hastily built cities of the United States, a great opportunity seems at last to loom on the immediate horizon. The thinking of Americans in this field has been gradually crystallizing. The trials, the successes, and the failures of our enterprises in land development and housing under various procedures, in "subsistence homesteads" and in metropolitan and regional planning, have greatly helped to bring the real issues to the surface and to clarify and crystallize our thinking.

We cannot look for satisfactory solutions solely in the isolated colony of small farms, nor solely in the rebuilding of slums. It begins to be clear that we can most nearly effect the economies we desire, most nearly provide a combination of urban living and countryside opportunities, and most nearly meet the deep-seated impulses of American life, through the semi-decentralization of industry and population mainly within the regions immediately surrounding our hundred-odd metropolitan cities. The suburban "garden city," developed in close association with industry on the one hand and with great park and forest areas and the open country on the other hand—such a community more than ever before emerges as the solution for a sizable proportion of the American people. The English garden city* may very well serve as the trial-and-error experiment from which we can re-adapt the principles for use in the American situation.

All of this has been said many times. But just now, with public interest aroused, with vast programs taking form, with our idealism again at high pitch, with officialdom eagerly seeking sensible, satisfactory types of projects, now is the great opportunity for one or more agencies, most notably Federal agencies, to focus attention on the "garden city." We should by all means and at once examine the principles and the possibilities in this type of development. Any big program should take advantage of the chance to build at least a few semi-decentralized, industrial garden cities, incorporating all that we have learned by bitter experience of the way to get (and the ways not to get) the kind of living and working conditions we want in the United States. Here lies a challenge to our courage and intelligence. Here lies an opportunity of a lifetime.

JACOB CRANE,
President, American City Planning Institute.

* Official English definition:
"A Garden City is a town designed for healthy living and industry, of a size which makes possible a full measure of social life, but not larger; surrounded by a rural belt; the whole of the land being in public ownership or held in trust for the community."

"100 New Towns for Britain"

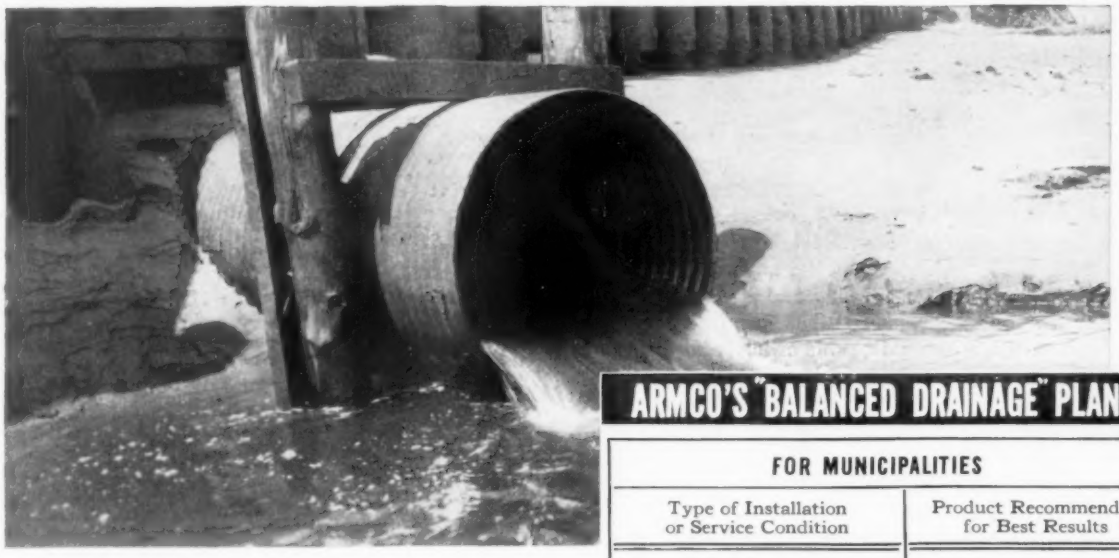
is the title of a handsomely printed and illustrated monograph of 76 pages, a third and enlarged edition of which was published in November, 1934, by the Gresham Press, of London. This scheme of national reconstruction, proposed by "Ex-Service Man J 47485," is recommended as "worthy of the fullest investigation and discussion," by a distinguished group consisting among others of S. D. Adshead, Professor of Town Planning at the University of London, and Sir Frederick Gowland Hopkins, President of the Royal Society.

The purpose as stated on the front cover of the monograph is to "solve the slum problem, give creative employment, save the countryside, and make an A 1 population."

This Plan Will Help You Choose

the right drain

for Each Service Condition



ARMCO'S "BALANCED DRAINAGE" PLAN

MUNICIPAL engineers and officials agree that *service conditions vary.* That's why it is so important to choose the type of drain which is best suited to the individual conditions of each job—or location.

To simplify your problem, Armco offers you a "balanced drainage" plan—with a correctly designed product for every service condition. 29 years of experience prove that this plan insures dependable drainage at the *lowest cost per year.*

ARMCO CULVERT MFRS. ASSOCIATION
Middletown, Ohio

FOR MUNICIPALITIES

Type of Installation or Service Condition	Product Recommended for Best Results
Storm Sewers under or along streets (except unimportant locations)	Armco Paved Invert Pipe
Stream Enclosures across property	Armco Paved Invert Pipe
Storm Sewer Outfalls (Especially (1) in unstable soils, (2) on steep slopes, and (3) in deep ditches)	Armco Paved Invert Pipe
Less important sewers under normal or favorable conditions	Armco Corrugated Iron Pipe*
Street Intersections, Entrance Culverts, etc.	Armco Part Circles or Corrugated Pipe
Conduits for water, gas, and other lines	Armco Corrugated Iron Pipe or Armco MULTI PLATE
Small Bridges, and Pedestrian Underpasses	Armco MULTI PLATE Pipe or Arches
Subdrains	Armco Perforated Pipe

*Armco Paved Invert Pipe gives longer life and costs less per year under all conditions and, where funds permit, should be substituted for unpaved Armco pipe, even though the latter has a 29-year service record to date.

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★ **FOR TRUE ECONOMY** ★

make service conditions your guide

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

Detroit Police Use Amplifiers to Control Pedestrians

DETROIT, MICH.—The Police Department of the city of Detroit, having met with considerable success in controlling traffic through the use of so-called "sound" vehicles, decided that if amplifiers were placed at heavy traffic intersections during the Christmas holidays, this might have considerable effect in controlling pedestrians and thereby facilitate the movement of traffic.

As an experiment, a sound-car was placed at an important business intersection and tried out. The pedestrians responded to the pleas of the operator in obeying the signal lights. Arrangements were then made for the use of amplifiers for the two weeks prior to Christmas, and on December 15, 1934, we started operation with trained police officers at the microphone; immediately there was a favorable response on the part of pedestrians to the requests of the officers to cross with the lights. The obedience they gave to the officers was a remarkable tribute to the intelligence of the American public. Only occasionally did some person disobey the request of the officer, usually someone of foreign extraction who did not understand the English language.

In former years it was necessary for the Police Department to maintain four mounted officers at the principal intersections to control pedestrians, and even this did not exactly prove successful, for some persons persisted in going around the horses. But when the same people attempted to cross the intersection and their disobedience was called for all to observe, they felt different and stepped back to the curb. The pedestrians obeyed the speakers so well that it was not necessary to increase the number of traffic officers at these intersections.

A large number of lost children were restored to their parents by means of the speakers. At frequent intervals warnings were also broadcast to shoppers to beware of pickpockets and also for women not to lay their pocketbooks on the counters while shopping; this was so successful that not a single complaint of pickpockets or lost pocketbooks was registered during the holidays, whereas in other years a large number of pickpocket complaints were registered. The use of amplifiers also had its humorous side, as the following taken from one of the newspapers will show:

"Santa Claus himself was among those pedestrians who had their mistakes called to the attention of the downtown crowds. The old gent who occasions all the shopping was just stepping off the curb when the giant voice came thundering from the air."

"Santa Claus," it shouted, "what will these little children think when they see you jaywalking like that?" Back to the curb hurried St. Nick, his face just a trifle more red than his suit.

It was necessary to change the officers on duty at frequent intervals, owing to the strain on their vocal cords.

EDWARD A. MITTE,
Director of Traffic.

Canton Police Strong Supporters of Motorcycles

CANTON, OHIO.—Population 105,000 in area 13.62 square miles; 325 miles improved streets and 31,000 locally registered motor vehicles; two national and three state highways pass through this city that ranks third in state for through traffic.

Who would question the value of a mounted traffic man on the streets and highways in these days of vehicular congestion? A motorcycle officer commands and receives the respect of the public perhaps in a greater degree than any other law-enforcing officer.

To regulate and govern the flow of traffic in Canton, there is maintained a subdivision of the Police Department, a Division of Traffic employing a motorcycle squad of ten to fifteen officers. Figures show that with an increase of motorcycle officers there is a decrease in traffic fatalities, and with a decrease in the motorcycle officers there is a decided increase in traffic fatalities.

We believe that prevention is far better than cure, and the value of a motorcycle officer cannot possibly be estimated in dollars and cents, or by an income resulting from fines. His job is *preventing* violations and to *render assistance*, and any official or group of officials that establishes such a division of police to make it self-supporting or for *possible revenue* by actively engaging in the practice of *persecuting* motorists, is approaching the problem from the wrong angle and is establishing a burden and a parasite instead of a blessing.

We are in the machine age, when every person who is physically able to sit behind the wheel of an automobile does so. Many of these are unfit to be drivers: color-blind, too young, handicapped by some physical disability that got by. More dangerous than all of these are those who willfully and maliciously violate the laws of both God and man.

We believe that if all states and municipalities were to maintain a force of mounted officers, our national death toll would suddenly decrease to an unbelievable level. We quote here cost statistics covering operation of a fleet of 15 motorcyles for one year in Canton. These figures include everything except salaries for all 12 months, for they were used straight through the winter of 1932-33 with sidecars and windshields.

Total miles	120,000
Average miles per machine	8,000
Total maintenance cost	$1,678.42
Average cost per machine	111.90
Average cost per mile per machine	0.01397½

MOUNTED SECTION OF THE TRAFFIC DIVISION, POLICE DEPARTMENT, CANTON, OHIO

Taken at the foot of the McKinley Monument. The row of four, from left to right: George F. Schoner, Safety Director; Mayor H. F. Witter; G. H. Muehleisen, Traffic Commissioner; E. W. Hexamer, Chief of Police

WAMBLU TRAFFIC MARKERS

1. For economical marking
2. Are applied quickly
3. By unskilled labor
4. With no traffic delay
5. Have high visibility
6. During a long life
7. Under heavy traffic
8. With no upkeep cost

Guaranteed for a full traffic season

WAMBLU MARKERS are NOT paint, but a heavy, paint-impregnated fabric, coated on the back with adhesive. It is necessary only to separate the strips (shipped back to back with adhesive sides together), apply them to the pavement, and *the job is done.*

No need to pay high prices for labor: *Unskilled* laborers can quickly lay down these WAMBLU MARKERS.

No need to delay traffic, waiting for paint to dry.

No need to pay heavy costs for frequent repainting. WAMBLU MARKERS are long-lived.

WAMBLU MARKERS are furnished in 25-foot lengths, 5, 7 and 10-inch widths. Municipalities usually specify the 30-inch letter, although a larger and a smaller size are obtainable.

Write us for samples and prices

WAMBLU CORPORATION
1378 Ridge Road, E., Rochester, N. Y.

KEEP RIGHT . . WITH WAMBLU

I wish to state emphatically that motorcycles represent the most valuable piece of police equipment that could be employed by any city, especially in the regulation of traffic.

G. H. MUEHLEISEN,
Commissioner of Traffic.

62 Motor Busses with Trolley Poles at Newark

NEWARK, N. J.—In the city of Newark a new type of bus has been designed and is now being built—a gasoline-electric bus that is equipped with trolley poles. It is therefore a marked advance over the trackless trolley now used in many cities but which is as restricted in its operation as was the trolley.

The new bus for Newark operates as a trackless trolley when on streets that have overhead wires, and as an electric-driven motor-bus when its schedule or the demands of customers call it away from the wired streets. The new bus, therefore, will not go around in the same old circles day after day, but will be prepared to leave the overhead "tracks" and meet competition and develop new business. This sort of thing, this aggressive holding on to the reality of wires and poles and power plants, and at the same time reaching out for the revenues from modern bus operation, should offer far greater protection to security holders than even the trackless trolley.

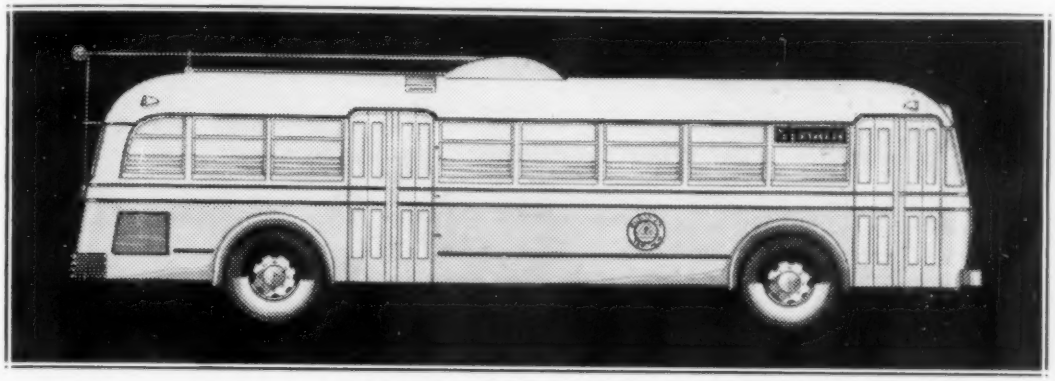
The engineers of Public Service Coordinated Transport, Newark, N. J., asked themselves whether or not the particular advantages of street cars, trolley-busses and gasoline motor-busses could be united in one vehicle. Take an ordinary gas-electric bus now in general service, install a set of trolley poles on the roof and a double electric controller so that the driver can shift from one operation to another. This was the principle, and tests with such a bus at Weehawken in January, 1934, proved that the scheme was practicable. As a result, 62 "all-service" busses are now being built to the company's design by General Motors Truck Co.

This is the materialization of a suggestion made by Martin Schreiber, General Manager in charge of Plant, Public Service Coordinated Transport, at the meeting of the National Association of Motor Bus Operators in 1933. The problem was how to substitute busses for street-car lines without sacrificing the entire property, and Mr. Schreiber, who was Chairman of the Special Consulting and Development Committee, said: "A suggestion worthy of consideration in this dilemma is the use of the well-known gas-electric bus as now developed, having a gas engine and an electric generator and two propulsion motors. By the addition of trolley poles and control mechanism to the gas-electric bus, you have a vehicle that may be used either as a trolley-bus when the engine and generator are cut out, or as a motor-bus by the simple operation of pulling down the trolley poles. Here, then would be a vehicle that would meet the requirements of the trolley-bus or the ordinary city motor-bus, and at the same time the generating and distribution portions of the plant of the street railway would be preserved."

Each of the three common modes of street transportation has certain advantages. Street cars use low-cost central-station power and furnish a heavy off-peak load, thus helping to balance the load on the power station. Where the busses are operated by the central-station company, as they are in Newark, or if they should be operated by a municipality owning its electric plant, such busses can furnish a load whenever the plant can use it. Power needs in transportation are almost momentarily varying, and electricity is the most flexible form of power and electric motors can take 200 per cent overloads on occasion or for short periods. The trolley-bus is quieter and accelerates faster than other highway vehicles of large seating capacity. It requires overhead wires, but no tracks and can therefore afford curb loading and keep in line with the flow of traffic. The gasoline motor-bus is the most mobile form of highway transportation; in short, as regards flexibility, it is in the class with passenger automobiles.

The new bus, as designed by Public Service Coordinated Transport, seats 36, and has an all-metal body of light-weight streamlined construction with a side-exit door. It weighs 2,000 pounds less than the standard gas-electric busses operated by this company. The gasoline engine and electric generator are mounted in transverse position in the rear of the vehicle, permitting equal distribution of weight on all six tires. The outstanding safety feature is the three independent braking systems: air brakes on all four wheels; manually operated brakes on the shafts of the two propulsion motors; and electric brake, as on electric trains and street cars.

The gasoline engines are 125-hp supercharged, in which a small centrifugal pump forces a mixture of air and gasoline under 4 to 5 pounds pressure, thus increasing power to 160 hp. This is a method of obtaining great power at little weight that is used in racing cars and airplanes and is now winning prestige in the automobile field. These engines drive the two 35-hp electric motors that in turn drive the bus. The motors, thus operated, take a 100 per cent overload. When the same motors are fed from the trolley wire, they take a 300 per cent load when needed for starting or climbing hills and give an advantage in performance over the gasoline-engine-driven bus.



THE ALL-SERVICE MOTOR-BUS WITH TROLLEY POLE, FOR NEWARK

The poles are placed on the wire in the same way that poles of trolley cars are placed; but a device is provided by which the operator can draw down the poles in position on the roof while the bus is in motion. A series of mirrors gives the operator, in his seat in front, a full view at all times of the side-exit door and step, even when the aisle is crowded. Of interest to passengers: safety glass is used in all windows; the seats are airplane type; the illumination is without glare; thermostats control the heating.

And the bondholder has reason to hope that his paper represents something tangible, and a business with a future.

Intelligence and Progress

Our greatest failure of all, perhaps, from the standpoint of practical psychology, is the inclination to drift away in all of our talks of economic principles and social reconstruction from the simple fact that we are dealing with human beings and that we cannot and dare not progress beyond their average and composite intelligence and vision and self-interest.

—From a speech by Ralph Bradford, Manager of the Commercial Organization Department of the Chamber of Commerce of the U. S., at the last annual meeting of the National Association of Commercial Organization Secretaries.

THE SPIRIT OF SERVICE

THE value of a nation-wide telephone service, under one unified system, is reflected in the day-by-day efficiency of your own telephone. It is given dramatic emphasis by an emergency.

Several years ago, the worst sleet storm in telephone history swept north from Texas almost to the Great Lakes and ravaged a section 150 miles wide. Thousands of telephone poles were broken. Thousands of miles of telephone wire were snapped by the weight of clinging sleet. Telephone communication throughout the country was affected by this gap in the Middle West.

To restore the service quickly was beyond the power of the local telephone companies. Had they been forced to tackle the job alone it would have taken months and imposed a heavy financial burden. Instead, the full resources of the Bell System were thrown into the breach. From the Southwest, from New York, Pennsylvania, Ohio and the Northwest, the repair trucks started rolling into the stricken area.

Even while men were on their way, the warehouses of the Western Electric Company started shipments of tools, wire, poles, cross-arms and other needed equipment. It was only because of standardized material and standardized methods that the emergency was met and service quickly restored.

Telephone service as you know it today would be impossible without the unified Bell System.

The Western Electric Company is the manufacturing, distributing and purchasing organization for the Bell System. Centralized activity of this kind means better quality at lower cost.

BELL TELEPHONE SYSTEM

Water Rates and Service Charges, Installation Charges, Hydrant Rentals and Sprinkler Costs—X

Abstracts of Water Department and Company Reports

New Kensington, Pa.

Population	35,000
" served	35,000
Number of services	6,882 (some in ahead of paving)
" " meters	6,199
" " hydrants	370 public; 46 private
Miles of water main approximately 55; ¾" to 16"	

The Kensington Water Co. distributes water in the boroughs of New Kensington, Arnold, Parnassus and vicinity in Westmoreland County, Pa. The meter rate schedule for water service is as follows:

First	1,500 cu. ft. or less used per quarter by one consumer	$3.25
Next	10,000 " " " " " " " " "	20 per 100 cu. ft.
"	20,000 " " " " " " " " "	.18 " " " "
"	20,000 " " " " " " " " "	.15 " " " "
"	20,000 " " " " " " " " "	.12 " " " "
"	200,000 " " " " " " " " "	.10 " " " "
"	200,000 " " " " " " " " "	.08 " " " "
"	200,000 " " " " " " " " "	.06 " " " "
"	200,000 " " " " " " " " "	.05 " " " "
Over	871,500 " " used per quarter by one consumer	04½ " " " "

Where bills are rendered covering a period of less than one quarter, the quantity of water charged for under each step is changed in proportion.

The minimum charges for water service, based on the size of meter installed are:

½" or ¾"	meter	$ 3.25	for each consumer	per	quarter		
¾"	"	4.50	"	"	"	"	"
1"	"	6.00	"	"	"	"	"
1¼"	"	9.00	"	"	"	"	"
1½"	"	12.00	"	"	"	"	"
2"	"	24.00	"	"	"	"	"
3"	"	50.00	"	"	"	"	"
4"	"	100.00	"	"	"	"	"
6"	"	150.00	"	"	"	"	"
8"	"	200.00	"	"	"	"	"

These charges are payable in advance. Where it is desired to render bills monthly, instead of quarterly, these amounts are decreased in proportion. Each minimum charge entitles the consumer to the use of the number of cu. ft. or gals. per quarter, or fraction thereof, for which the minimum charge would pay, as indicated by the scheduled rates. The minimum allowance for ½" and ⅝" meters is 1,500 cu. ft. per quarter. The size of meter set is governed by the size of service line which the consumer requests the company to install, except that since a ¾" is the minimum size of service installed by the company, the consumer may use a ⅝" meter on a ¾" service.

Service connections are made to improved property only upon written application signed by the property owner or his authorized agent. The company taps the main, inserts the corporation cock, carries the service pipe to the curb, inserts a curb cock and curb box for each consumer. All of these remain the property of the company and are maintained by it. The owner must furnish and install a service line beyond the curb box for each consumer. This service must be of lead, lead-lined, copper, galvanized or cast iron pipe to and inside the wall of the building or housing facilities for the meter, on which is placed a stop and waste cock immediately inside the building. All service pipes must be laid at least 4 ft. deep and not less than 4 ft. distant from any open area or vault. The company furnishes meters for all services except for distinct fire lines, on which a detector meter furnished by the consumer will be installed subject to the approval of the company. The company maintains, repairs and adjusts all meters except when damaged through extreme heat or cold or accident.

Domestic meters are read and bills rendered quarterly, and commercial and industrial meters are read and bills rendered either monthly or quarterly. All bills are payable at the company's office or at other places that may be designated by the company for the convenience of consumers. All bills to consumers are due and payable 10 days after the date of billing. If a bill remains unpaid longer than 20 days after the date of bill, the company reserves the right to discontinue the service for non-payment of bills. If a service has been discontinued for non-payment, a charge of $1.00 is made to cover the cost of turning off and turning on water again, and is payable before the water is turned on.

Private fire protection service, the charges for which are payable quarterly in advance, are as follows:

2" tap in the street main	$60.00	per year
4" " " " " "	120.00	" "
6" " " " " "	200.00	" "
8" " " " " "	300.00	" "
Each standard fire hydrant	45.00	" "
Each hose opening 2½" or less	25.00	" "
Each sprinkler head	05	" "

The consumer is entitled to the number of hydrants, hose connections or sprinkler heads indicated by the charge for the size of pipe employed, and all over this number are charged at the regular schedule rate, except that where fire service is permitted through the same service line and meter as that providing water service, the regular minimum charge as indicated under the regular meter schedule for the size of meter employed applies; and when the charge for water amounts to double the minimum quarterly rate for the meter employed, no additional charge is made for fire protection service.

The charge for public fire hydrants, payable quarterly, within the corporate limits of the boroughs, is $35.00 each per year. Water for public sewer flush tanks is charged at 10c per 1,000 gals.

JAMES G. GRIFFITHS,
Superintendent, Kensington Water Co.

Compton, Calif.

Population	13,000
" served	15,000
Number of services	4,400
" " meters	4,400
" " hydrants	380
Miles of water main	56.0

The schedule of rates supplied to consumers through meters is as follows:

First	800 cu. ft.	12½c per 100 cu. ft.
Next	4,200 " "	10c " " " "
All in excess of	5,000 cu. ft.	8c " " " "

The minimum monthly bill is $1.00. A consumer is required to deposit $2.50 with the Water Department unless credit has been established. A discount of 25c is allowed on the meter bill if it is paid on or before the 15th of the month in which it is presented. Water may be turned off if the bill is unpaid on the 16th of the second month following billing, and a charge of $1.00 is made for continuing the service.

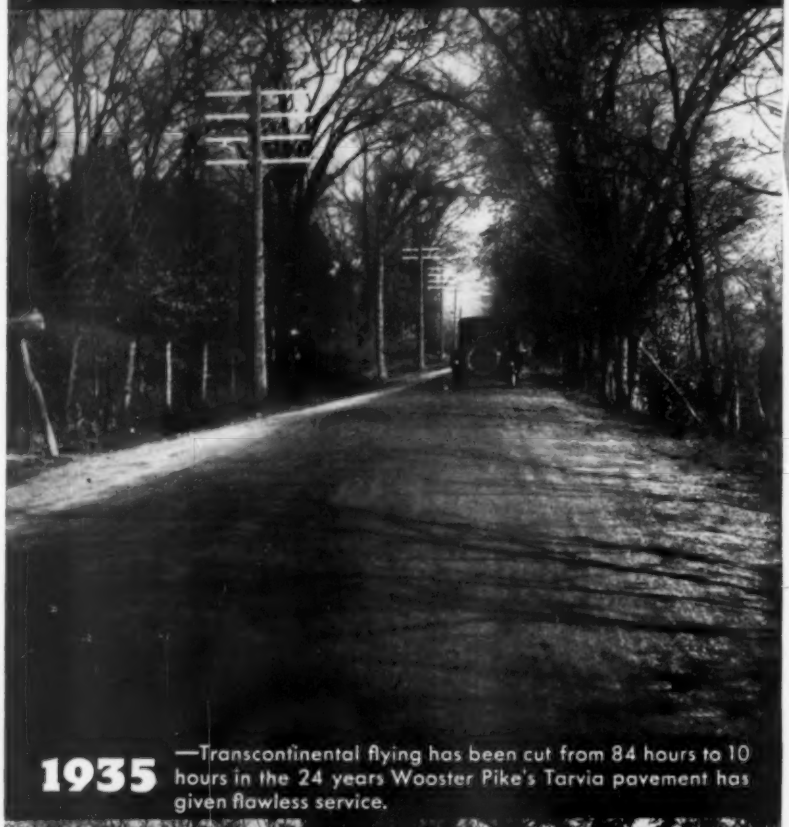
Consumers or their representatives must make application for services on a form furnished by the Municipal Water Department and pay the following charges for the installation of a service and meter:

¾" service and meter	$15.00
1" " " "	35.00
1½" " " "	70.00
2" " " "	100.00

There are no rental charges for municipal fire hydrants and no charges for special fire lines.

C. A. PARRISH,
Foreman, Municipal Water Department.

1911 —While Wooster Pike, near Cincinnati, Ohio, was being Tarvia-built, Americans were thrilled by the first transcontinental airplane flight.



1935 —Transcontinental flying has been cut from 84 hours to 10 hours in the 24 years Wooster Pike's Tarvia pavement has given flawless service.

Barrett

Tarvia

GOOD ROADS AT LOW COST

Twenty-four years of uninterrupted service is not an exceptional performance record for a Tarvia road. Highway officials all over the country have had similar experiences with Tarvia. They know—and appreciate—that Tarvia roads are easy and economical to build, and need only the simplest and most inexpensive maintenance to make them last indefinitely, always smooth, easy-riding and skid-safe.

THE BARRETT COMPANY New York Chicago Philadelphia Birmingham St. Louis Minneapolis Cleveland Boston Detroit Baltimore Youngstown Cincinnati Buffalo Rochester Syracuse Bethlehem Providence Toledo Hartford Portland, Me. Lebanon Columbus Milwaukee In Canada: THE BARRETT COMPANY, LTD. Montreal Toronto Winnipeg Vancouver

Dubuque, Iowa

Population	43,000
" served	44,000
Number of services	9,201
" " meters	9,188
" " hydrants	804
Miles of water main	114.0

The monthly meter rates in Dubuque are as follows:

1st	1,000 cu. ft.	@	225	per 100 cu. ft.
2nd	1,000 " "	@	.18	" " " "
3rd	1,000 " "	@	.135	" " " "
Next	7,000 " "	@	.117	" " " "
"	5,000 " "	@	.108	" " " "
"	10,000 " "	@	.099	" " " "
"	25,000 " "	@	.09	" " " "
"	50,000 " "	@	.072	" " " "
"	100,000 " "	@	.063	" " " "
Balance	" "	@	.054	" " " "

The monthly minimum charge is based on the size of the meter:

⅝"	68c	1½"	$1.75
¾"	$1.00	2"	2.00
1"	1.25	3"	3.00
1¼"	1.50	4"	4.00
		6"	6.00

The quarterly meter rates, for which 800 cu. ft. is allowed at a minimum charge of $1.90, are the same per 100 cu. ft. as for the monthly rates, with the rates applying uniformly to three times the amount of water furnished under the monthly rate.

Applications for water service connections are made in writing to the Water Department by the owner or his agent or by a plumber acting as agent. Taps for connections are made by the water works for the plumber or owner at a cost of $2.50 for each tap in sizes of ¾" and 1" plus the cost of the corporation cocks and tailpiece for either lead or copper pipe, which is furnished by the water works at cost, provided all excavation is done by the plumber or owner. Larger connections are made at actual cost of labor and materials plus 10% for overhead. The laying of all service connections and pipe, setting of water service fixtures in streets, public grounds and in premises to be served by city water, is done by employees of the City Water Works or by a duly licensed plumber using pipe fittings, materials, etc., approved by the Superintendent. The service pipe must be of lead, copper or cast iron; lead services from ¾" to 1¼", copper pipe from ¾" to 2½", and cast iron in any available sizes. All cast iron services are laid by the Water Department at cost plus 10%. A curb box and shut-off for controlling the supply of water is placed on every service. Service pipes are laid at least 5½ ft. below the surface of the ground, and no shut-off is placed less than 5½ ft. or more than 6½ ft. below the surface of the ground. All service pipes and fixtures from the street main to the meter, including the corporation cock, are installed and maintained at the expense of the property owner. All permanent services must be metered except fire protection services, which may or may not be metered at the discretion of the Superintendent. All ⅝", ¾" and 1" meters are furnished free, one to a service line, by the Department. 1¼" and larger are furnished to the owner, by the Water Works, at cost plus a nominal charge for handling. All meters worn out from ordinary causes, are replaced free of charge to the property owner. The meter is installed just inside the basement wall at the end of the service pipe.

All fire service connections are installed by the Water Department from the street main to a point just inside the building, the excavation and opening through the wall being made by the applicant. The owner pays the cost of labor and materials plus 10% for overhead. No water is permitted to be drawn from fire service pipes for any purpose other than for extinguishing fires, and the city may at any time require the owner of premises to install a water meter on a fire line. The fire protection rates are as follows:

Heads	Cost per Year	Heads	Cost per Year
Minimum up to 200	$25.00	2,000–2,200	$80.00
200–300	30.00	2,200–2,400	85.00
300–400	35.00	2,400–2,600	90.00
400–600	40.00	2,600–2,800	95.00
600–800	45.00	2,800–3,000	100.00
800–1,000	50.00	3,000–3,500	105.00
1,000–1,200	55.00	3,500–4,000	110.00
1,200–1,400	60.00	4,000–4,500	115.00
1,400–1,600	65.00	4,500–5,000	120.00
1,600–1,800	70.00	5,000–5,500	125.00
1,800–2,000	75.00	5,500–6,000	130.00

Where consumers have installed a standpipe with provisions for hose connections, an adequate additional charge is made.

No charge is made to the city for the installation and maintenance of public fire hydrants. The Water Department receives no tax levy or hydrant rental and furnishes free to the city all water used by the Street, Sewer, Recreation and Fire Departments, and City Building. This is an annual saving of about $43,000.00 to the taxpayers.

J. Joseph Hail,
Accountant, Water Department.

Anaheim, Calif.

Population	11,000
" served	11,000
Number of services	2,979
" " meters	2,975
" " hydrants	373
Miles of water main	52.04

There are two schedules of rates for domestic water service, one applying within the city limits, and the other outside the city limits, as follows:

Rates Within City Limits

First	750 cu. ft.	$1.00 (minimum charge)
All over 750	" "	10c per 100 cu. ft.

When water is supplied to more than one lot or more than one dwelling or building occupied by more than one family, through one metered service, an additional charge of 25c is made.

Rates Outside City Limits

First	750 cu. ft.	$1.50
All over 750	" "	15c per 100 cu. ft.

Minimum Charges

Size of Service	Inside City Limits	Outside City Limits
¾"	$1.00	$2.00
1"	1.60	3.20
1½"	3.00	6.00
2"	5.00	10.00
3"	8.00	16.00
4"	12.50	25.00
6"	25.00	50.00

Each new consumer is required to pay a deposit equal to two months' bills, but in no case less than $2.50. In case of an unpaid bill, the amount of the bill is deducted from the deposit. Each deposit is retained until the service is discontinued and the final bill is paid.

The installation costs for meters are the same within and outside the city limits and are as follows:

¾" meter	$10.00
1" "	15.00
1½" "	25.00
2" "	35.00
3" "	100.00
4" "	125.00
6" "	165.00

An additional charge of $5.00 is made where it is necessary to cut a pavement. If the installation requires an extra-heavy cast iron meter box, an additional charge of $15.00 is made.

The monthly charges for automatic sprinklers are based on the size of the service pipe as follows:

2" pipe	$ .75	per	month
3" "	1.00	"	"
4" "	1.50	"	"
6" "	3.00	"	"

Connections for automatic sprinklers are made directly to the main without meters, and no water may be used for any other purpose than fire service. Where public fire hydrants are installed in the street, all charges of installation and service are made to the Fire Department, and the hydrants are owned by the Fire Department.

V. W. Hannum,
Superintendent.

Perth Amboy, N. J.

Population	58,900
" served	58,900
Number of services	9,046
" " meters	6,824
" " hydrants	542
Miles of water main	104.53

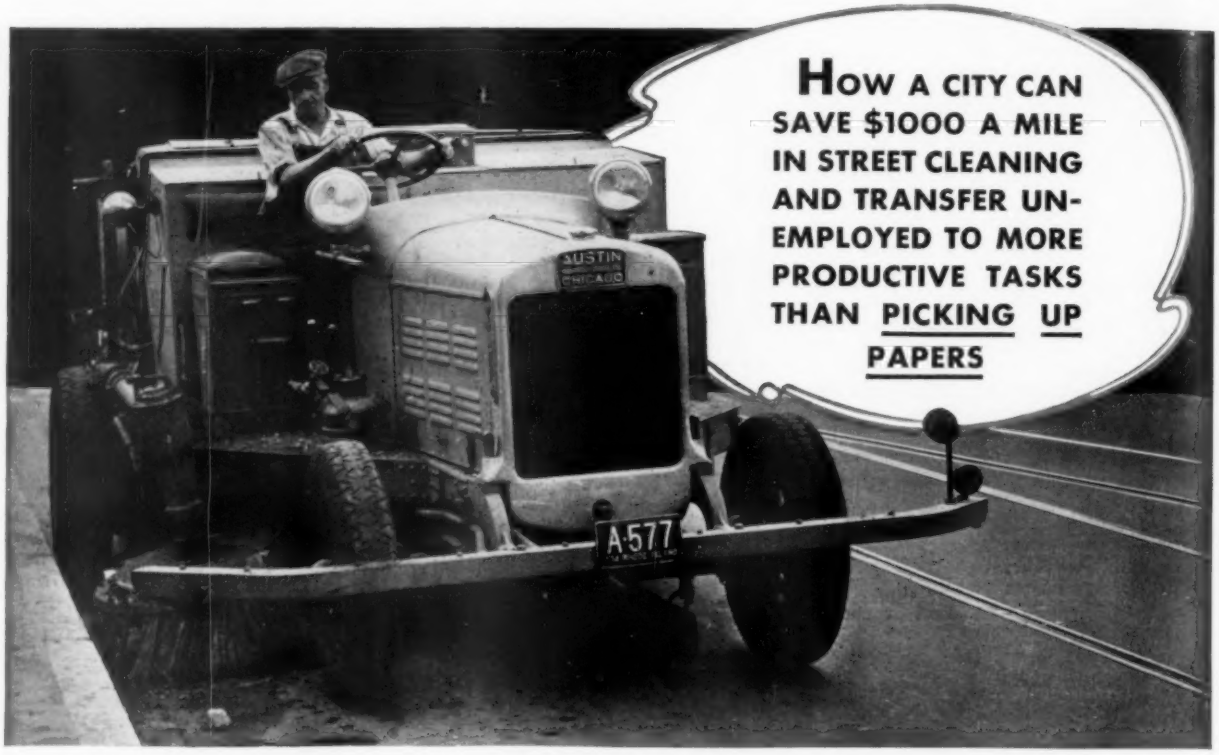
All services furnished with water by the city of Perth Amboy are metered, with a minimum charge of $3.00 per quarter, which permits the use of 1,000 cu. ft. of water. All water used in excess of this amount is charged at the rate of 17c per 100 cu. ft. When bills are paid within 30 days from the date of the invoice, discounts at the rate of 2% per $100 are allowed up to $1,750, or until maximum discount of 35% is attained. All bills are payable at the office of the Collector of Revenue, City Hall, and if not paid within 30 days after presentation, 6% interest is charged until paid; if not paid within 3 months, water is shut off and is not turned on again except on payment of arrears, with interest to the date of payment and a fee of $2.00. Bills may be paid monthly at the direction of the Board of Water Commissioners. Discounts refer only to monthly bills.

Supply for fire hydrants, public buildings, schools, hospitals, educational and benevolent institutions and municipal use is free. The only other charge is for rental of hydrants in the borough of Sayreville, which pays $37.50 per hydrant per year.

S. J. Mason,
Engineer and Superintendent, Perth Amboy City Water Works.

CITY ECONOMY PROGRAM

IN THE SPIRIT OF FEDERAL UNEMPLOYMENT RELIEF



HOW A CITY CAN SAVE $1000 A MILE IN STREET CLEANING AND TRANSFER UNEMPLOYED TO MORE PRODUCTIVE TASKS THAN PICKING UP PAPERS

AUSTIN-WESTERN MOTOR PICK-UP SWEEPERS

SUFFICIENT operating data has been collected from city records on Austin-Western Motor Sweepers to form a basis for planning future savings. An estimate can be furnished which will prove more than a bid or proposal. Austin-Western will draw up on request a 5-year economy program for a city's street cleaning department.

This is typical: Take a Southern city where streets are cleaned 250 days a year. Force, 24 men at $2.50 a day. Thirty-three miles of streets. Annual cost $15,000. The Austin-Western economy program would recommend two Austin-Western Motor Pick-Up Sweepers whose complete operating cost per year would be $12,600, *including monthly rental on the machines.* At the end of two years, with the machines paid for, the cost would drop to $5,600 a year. For a five year period the average annual street cleaning cost will drop from $15,000 to $8,400—thirty-three thousand dollars saved.

You can compare these figures with those that apply in your city. Or, on a more definite basis, let Austin-Western lay out a five year plan for your city, giving practical estimate in details. Send the coupon below.

Austin-Western Road Machinery Co.

NRA CODE

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The Austin-Western Road Machinery Co.
A-4, Aurora, Ill.
Send details on the Austin-Western Sweeper. ☐ Have checked square to show interest in 5-year program.
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DUMP WAGONS
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SCARIFIERS · BULLDOZERS · TRAILERS · SCRAPERS · PLOWS
DUMP CARS
CRUSHING AND WASHING PLANTS · SWEEPERS AND SPRINKLERS · SHOVELS · CRANES · ETC · SNOW PLOWS

Royal Oak, Mich.

Population	23,000
" served	20,000
Number of services	5,600
" " meters	5,600
" " hydrants	625
Miles of water main	130

The quarterly water rates are as follows:

First 700 cu. ft. or fraction thereof, $2.00 (minimum rate)
Each additional 100 cu. ft. up to 10,700 cu. ft. at 20c
All over 10,700 cu. ft. 16c per 100 cu. ft.

A discount of 10% is allowed if water bills are paid within 5 days, but if not paid within 15 days after the date due, the water is turned off and a penalty of $1.00 is charged for restoring the service. All unpaid water charges which have been delinquent for a period of two months on the first day of June of each year are transferred and re-assessed upon the city tax roll in the same manner as unpaid special assessments are transferred and re-assessed. There is no meter service charge.

Applications for service connections are made by licensed master plumbers on behalf of prospective consumers. All service connections and service pipes from the city's mains to the lot lines are put in by employees of the Water Department, cost included in tapping fee. The service pipe installation consists of tapping the main, inserting the corporation cock with proper couplings, laying the pipe from the main to the lot line, and providing a stop with an approved type of stop box and a cover marked "Water." All new service pipes connecting with the distributing pipes are of copper, lead or cast iron, with an inside diameter of at least ¾". In no case is the use of galvanized or wrought iron pipe permitted. The rules for the installation of service pipes from the property line to the building are very specific and provide a penalty of not more than $25.00 for each infraction of a rule by a licensed plumber, after charges are preferred and a hearing given. Meters are set in the building and are purchased by the consumer, the meter cost being included in the tapping fee.

The water service charges are:

¾" meter	$39.00
1" "	63.00
1½" with 1" meter	100.00
1½" " 1½" comp. meter	160.00
2" " 2" " "	200.00

GEORGE F. LANDGRAF,
Water Department Engineer.

Schenectady, N. Y.

Population	95,000
" served	100,810
Number of services	16,789
" " meters	2,181
" " hydrants	1,033
Miles of water main	161.9

There are flat and meter rates for premises both within and outside the city limits. Most residences, apartment houses and business establishments are on a flat rate. Such premises as bathing establishments, breweries, creameries, foundries, fountains, hydraulic elevators, malt houses, manufacturers, pump houses, railroad stations, saloons, soda fountains, theaters, etc., are served by meter service only. The meter rates for services inside or beyond the city limits are:

Each service using over 1,000,000 cu. ft. each 6 months:
6c per 100 cu. ft. for the first 300,000 cu. ft. and 5c per 100 cu. ft. thereafter.
Each service using less than 1,000,000 cu. ft. each 6 months:
8c per 100 cu. ft. for the first 300,000 cu. ft. and 7c per 100 cu. ft. thereafter.

In no instance is the total charge for 6 months permitted to be less than $3.00 per metered service. Water used for any other purposes outside the city is charged at triple the city rate. All consumers who are supplied through a meter outside the city pay in addition to the regular meter charges for such supply an extra charge of $9.00 for each family receiving water through a single meter.

All service pipes must be placed not less than 5 feet below the surface of the ground and must be maintained at the expense of the property owner from the corporation cock or street main to his own premises, as well as that part within his property.

There is no rental charge for public fire hydrants or for private fire services.

WALTER DANIEL PRZYBYLEK,
Superintendent, Water Department.

Chicago Heights, Ill.

Population	27,000
" served	27,000
Number of services	5,000
" " meters	5,000
" " hydrants	600
Miles of water main	105.5

The quarterly water rates for metered services are:

First	800 cu. ft. or less	$3.00 (minimum rate)
Next	4,200 " "	27c per 100 cu. ft.
Over	5,000 " " and less than 40,000 " "	11¼c " " " "
Over	40,000 " "	7½c " " " "

Meters 1" and larger are read and billed monthly. Two % discount is allowed if the water bill is paid before the last day of the month, and if the bill is not paid within 30 days the water is shut off and is not turned on again until the bill and $1.00 penalty are paid.

JOHN F. SCHUTZ,
Superintendent, Water Department.

Fresno, Calif.

Population	52,513	(Census 1930, within city limits)
Population served	75,000	
Number of services	19,300	
" " meters	2,515	
" " hydrants	1,136	(39 additional to be installed starting Jan. 1, 1935)
Miles of water main	245.0	

Domestic services in Fresno are on flat rate. The meter rates for commercial and industrial service, which includes apartment houses, are:

First	1,000 cu. ft. per mo.	@ 18c per 100 cu. ft.
Next	2,000 " " "	@ 15c " " " "
"	4,000 " " "	@ 7.7 c " " " "
"	26,000 " " "	@ 5.25c " " " "
"	34,000 " " "	@ 3.75c " " " "
Over	67,000 " " "	@ 2.25c " " " "

The Water Department pays for the installation of all services to property line, whether domestic, industrial, commercial, or fire sprinkler services.

The charge for hydrants is 50c per month per hydrant, made to the city. Service to private hydrants is charged at $1.00 per month per hydrant. The fire sprinkler charges are at the rate of $1.00 per inch of diameter of service, no meter being installed, and there is no charge for the water used for extinguishing fires, and no other use of water is permitted.

C. H. WEEKES,
Superintendent, Fresno City Water Department.

Alliance, Ohio

Population	25,000
" served	Unknown
Number of services	7,000
" " meters	6,500
" " hydrants	650
Miles of water main	63.0

The meter rates in Alliance start with a minimum charge of $3.25 per quarter, for which consumers are allowed to use 8,000 gals. The remaining rates are:

Next	42,000 gals.	19c per 1,00
"	50,000 "	12c " 1,00
"	1,200,000 "	11c " 1,000
Over	1,300,000 "	11c " 1,000

All consumers of metered water using over 1,300 gals. during any quarter are charged 11c per 1,000 gals. for the total amount used.

There is no charge to the city for the installation, service and use of fire hydrants, or for water used at the City Hall, City Hospital, or sewage treatment plant, or by the Fire Department.

J. O. STANLEY,
Superintendent, Water Department

Forest Park, Ill.

Population	15,000
" served	15,000
Number of services	2,783
" " meters	2,790
" " hydrants	276
Miles of water main	28.0

The quarterly water rates in Forest Park are as follows:

First	75,000 gals.	36c per 1,000 gals.
Next	75,000 "	
	to 300,000 "	30c " " "
All over	300,000 "	22c " " "

The minimum bill is $2.25 per quarter. A 10% penalty is added if the bill is not paid within 10 days, and water is turned off at the end of another 10 days without further notice if the bill still remains unpaid.

Meters are tested by the Water Department, upon request of the consumer, but if the test establishes the accuracy of the meter within 2%, the customer is required to pay $2.00 for the expense of making the test.

WILLIAM COUDOUX,
Superintendent, Water and Light Department

Reprints Ready
Price One Dollar

All reports published in 1934, covering 237 cities, have been reprinted in pamphlet form.

"IN 40 YEARS FROM NOW IT SHOULD STILL BE A GOOD PAVEMENT"

● Before the turn of the century, engineers were proudly viewing their completed brick pavements and confiding their belief that *here* was a pavement that would last.

Many of those pavements have long since exceeded the highest hopes of the engineers who built them, not only for length of life, but for lowest maintenance cost as well.

Today, the second and third generation of engineers are now relaying some of those 40-year old brick and saying—

"I shouldn't wonder if this pavement would last *another* 40 years or more."

Out of long experience, pavement builders and pavement users have learned that a brick pavement will outlast all others,—will cost *far* less per year of service.

Where you desire the minimum in pavement costs, use brick. Neither the weather nor the traffic will destroy it.

For recommendations on resurfacing various types of pavement with brick, write National Paving Brick Association (Affiliated with Structural Clay Products, Inc.) 1245 National Press Building, Washington, D. C.

Annual Meeting National Paving Brick Association, Feb. 7-8, Hotel Claypool, Indianapolis. Papers and discussions by leading Engineers.

BRICK

RESISTS WEATHER AS WELL AS TRAFFIC

TRAFFIC CONTROL AND FACILITATION

Conducted by Publications Committee, Institute of Traffic Engineers, 175 Fifth Ave., New York

Paul L. Green, Chairman; Melvin J. Bankhead, James R. Guthrie, T. T. McCrosky, D. Grant Mickle, Robert A. Mitchell, Edward J. O'Meara, Miss I. K. Rolph, Peter J. Stupka, J. C. Vincent, John C. Wrighton

Traffic Surveys by Manual

THE purpose of a traffic survey is to cut down the appalling waste in lives, suffering, time and money that is caused by defective methods of handling an increasing volume of ever faster moving traffic. The only way to achieve this objective broadly is for as many cities as possible individually to study the local problem and, so far as they can, to solve it as one of the many equations of the national problem.

The first requisite is to know how to make a traffic survey that will provide the facts on which remedial action can be taken. Rule-of-thumb or rough estimates will not suffice, any more than a cursory diagnosis of a neurotic will give the data on which a cure can be built. To make it possible for practically every community to conduct a scientific survey, the Federal Emergency Relief Administration has issued a Traffic Survey Manual, prepared under the direction of traffic experts. It is replete with detailed descriptions of how to proceed, and with numerous forms and diagrams that give the traffic engineer the facts of the specific traffic problem, and the chief of police the information he can use in the effective disposition of his force.

A personnel is necessary, and here again the Federal Government steps forward, this time to offer through the local ERA to supply the field and office workers and a director. W. O. Wheary, Director of Safety, Washington, will provide supervisory services.

The Major Studies

The first job is an analysis of accidents for the purpose of discovering the danger places in the area. These data show the chief of police where preventive work is needed, show exercised citizens which intersections actually are the worst and which ones only seem that way, and where signals, signs, markings and safety zones must be installed.

The vehicle count comes next. This will give the characteristics of the various streets, the timing of stop-and-go signals, and show where to repair paving and improve street lighting. The number of vehicles having been determined, it is necessary to find out at what rates of speed they are traveling.

Then come the observations of the heed paid to signals by both drivers and pedestrains. These will show not only where traffic signal faces should be added or relocated, but which signals should be removed or placed on flashing operation.

Next, the traffic law enforcement study, to show what the courts do with accident and speeding cases and how the methods can be improved, and to furnish grounds for police and court cooperation. The Enforcement Index is the ratio of the number of convictions for all violations involving moving vehicles to the number of accidents involving deaths or personal injuries.

A study of how school children cross streets, observe signals and generally respond to control, shows the situation and the needs, and then to what extent school safety programs are forming safety habits.

An interesting inquiry, calling for intelligence and thoroughness if it is to be of value, is the measure of the public opinion of drivers. Zealots can make laws, but will the people obey or, better, respect them? This study develops what drivers know or do not know about traffic laws and the causes of accidents. The entire questionnaire for drivers to fill in is provided in this Manual. It is recommended that at least 700 replies be obtained per 100,000 population.

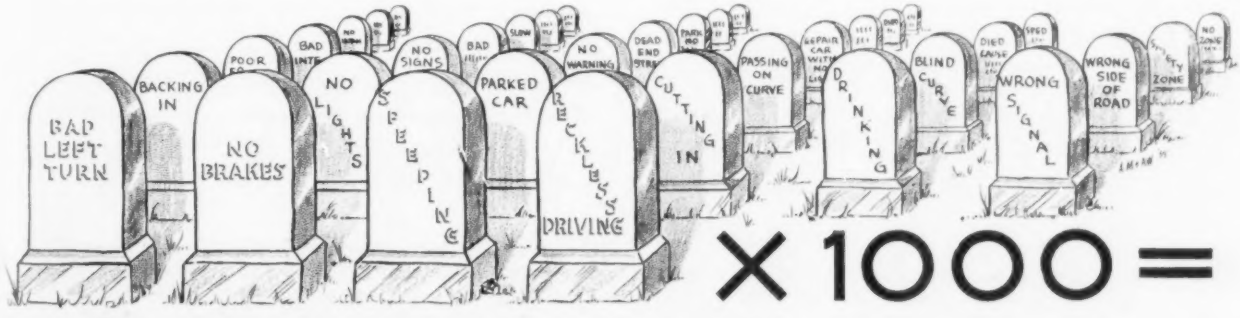
The parking nuisance has been ironed out in comparatively few cities. Convenient facilities for parking are so universally desirable as to be almost a birthright of the modern citizen. How to extend to her and to him this convenience without unduly impeding traffic, travel and business is the purpose of the street parking study. The secret is to know the requirements of the community and then plan the street functions to meet those requirements.

The business district is a study in itself and is called the cordon count. How many vehicles enter the district in a day? What are the busiest hours? The most congested streets? How many people come in private cars, busses, street cars, afoot?

The Traffic Survey Manual describes each of these studies in detail and furnishes specimens of the 48 forms and 5 diagrams specified for a complete traffic survey.

A Practical Survey

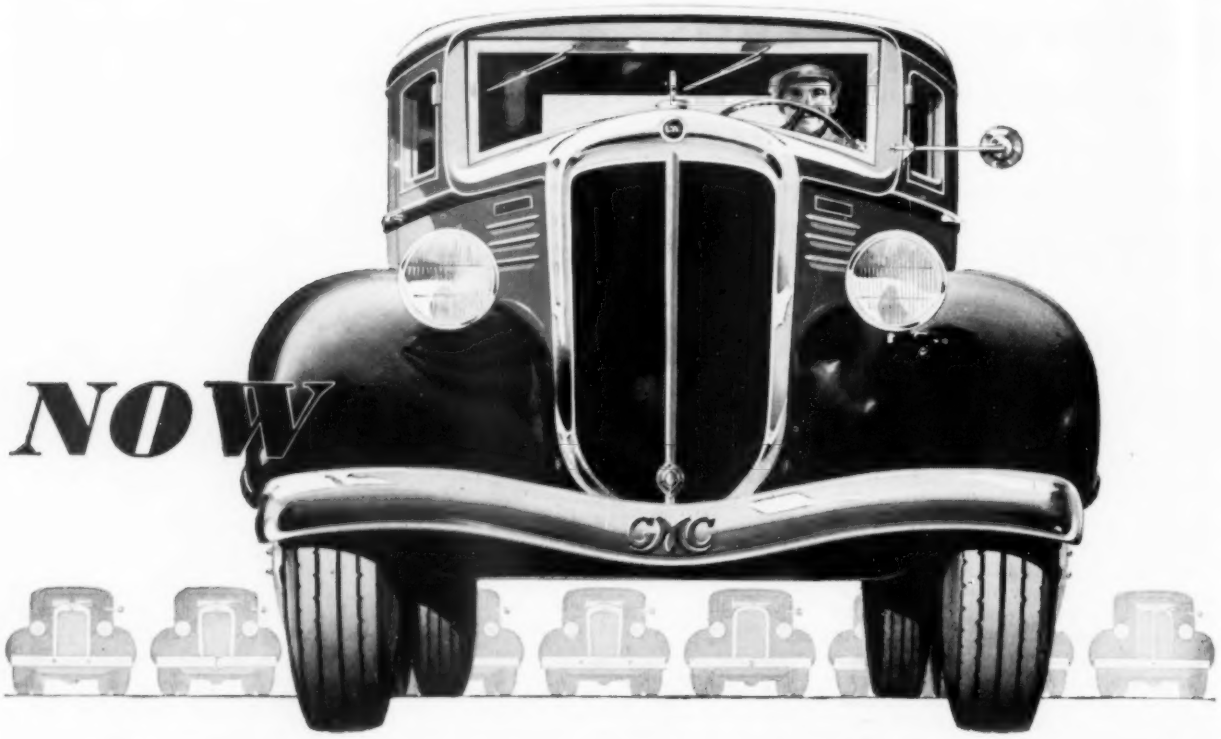
To make such a survey will cost money, but the purpose is to facilitate travel and make it safer, pleasanter, cheaper. These studies are not intricate or involved; but they are tedious, and thus they call for conscientious supervision. A traffic engineer applying his knowledge, experience and discrimination to the traffic problem of a given



TRAFFIC FATALITIES OF 1934

THE PURPOSE OF A TRAFFIC SURVEY ON A NATION-WIDE BASIS

is to take some of the stones out of this picture and certainly to permit no more to enter it. There are 36 of them, or about 1/1,000th of the 35,500 traffic deaths reported for 1934. The Federal Government presents an opportunity for you to have your traffic problem studied at minimum cost by men who are thinking nationally, so that what is done in your town and vicinity will be part of the entire solution represented by these statistics of the National Safety Council—35,500 in 1934; 31,363 in 1933; 29,451 in 1932; 33,675 in 1931; 32,929 in 1930



—out ahead with a wider lead than ever!

*Important 1935 improvements, including HYDRAULIC BRAKES, assure better performance and greater earnings for GMC truck buyers

ON THE BASIS of comparative specifications or that of work done and profits earned, cold logic on the one hand and actual facts on the other have proved that General Motors Trucks challenge the entire field. Improvements, gradual and unheralded, have won for every unit in the entire line the confidence of an ever-increasing number of shrewd business men who judge truck value by the only sound yardstick, that of "earning ability" per dollar invested.

Now, at the start of 1935, important improvements, such as those listed below, assure still better performance, still greater economy, the ability to out-perform and the ability to out-earn in a more pronounced way than ever before.

More and more thousands of profit-minded truck buyers are swinging to General Motors Trucks. Even in the intensely competitive low-priced 1½-ton field of usage, shrewd buyers are proving daily that it pays to invest a few dollars more for the quality-built, all-feature 1½-ton to 2-ton GMC T-16.

A phone call to your nearest General Motors branch, distributor or dealer will bring you the bedrock facts. Representative models of the 1935 GMC line are now on display.

***NOTEWORTHY 1935 IMPROVEMENTS:**

Hydraulic brakes standard on all light and medium-duty models; centrifuse or cast nickel iron brake drums; exceptionally large braking surfaces; increased fuel economy; increased power; increased torque; dual performance rear axle available in 2-3 ton range; finer appearance—sloping radiator, skirted fenders, fender-mounted headlamps, drop-skirted cabs, horizontal louvres and optional group of de luxe equipment (at slight extra cost).

GENERAL MOTORS TRUCKS *and* Trailers

1½ TO 22 TONS

GENERAL MOTORS TRUCK CO. Time Payments Available Through Our Own Y.M.A.C. PONTIAC, MICHIGAN

Do you mention THE AMERICAN CITY? Please do.

community should be able to save considerable money over his fee and the cost of an "amateur" survey that followed religiously *all the lines* laid down in the Traffic Survey Manual. On the other hand, if there is going to be an amateur or local police survey, it would be much better to have it over-done and accurate than skimped and inaccurate. Following this Manual assures thoroughness, and guarantees that those using it will have a working knowledge of the art when they have completed one of these surveys, if they did not have it when they started. Furthermore, while 50 per cent of the art consists of the drudgery of collecting correct and ample statistics, the other 50 per cent consists of the shrewd and accurate use of them in providing the full and successful solution to the particular traffic problem.

The organization of the Federal Emergency Relief Administration Traffic Survey is given below:

Director, W. O. Wheary, 1734 New York Avenue, Washington, D. C.

Associate Directors: Maxwell Halsey, 1 Park Avenue, New York; for Maine, N. H., Vt., Mass., R. I., Conn., N. Y., N. J. Burton W. Marsh, 406 Mills Building, Washington, D. C.; for Pa., Del., Md., D. C., Va., W. Va., N. C., S. C., Ohio, Ky., Tenn., Ga., Fla., Ala., Miss. Earl J. Reeder, 20 North Wacker Drive, Chicago, Ill.; for Mich., Ind., Wis., Ill., Minn., Iowa, Mo., Ark., La., N. Dak., S. Dak., Nebr., Kans., Okla., Texas. W. O. Wheary, for Mont., Wyo., Colo., N. Mex., Idaho, Utah, Ariz., Wash., Ore., Calif.

St. Louis Cited

If Traffic Showed a Profit.—The Board of Estimate and Apportionment of St. Louis forgot to include salaries of the traffic section in the budget for the last fiscal year, and the money had to be obtained by transfers from other funds. This is not likely to happen again should the section become self-supporting. The report referred to, for the year ending in April, 1934, foresees a profit from ordinances covering busses and trucks and from a drivers' license bill if it is passed at the next meeting of the State Legislature. With an increase in revenue, more money would be available for signalization, printing traffic lanes, increasing the number of inspectors, and giving better service throughout the city.

Signals as Part of Street Projects.—Signals are just as much a part of street improvements as the curbing, says the report. When widening the many new thoroughfares during the past few years, these signals were not included, and as a result many traffic hazards were created. An opinion from the City Counselor states that money could have been obtained from the bond issue funds for signalization. On any future widenings, automatic signals should be included as part of the completed highway, so that when the street is ready for opening, the hazards will be properly taken care of.

Eliminate the Left Turn.—Left turns constituted the third most dangerous hazard, with collisions at intersections (no cause given) first, and drunken driving second. The report recommends the elimination of the left turn where possible. While there are some cases where left turns are necessary, they should be avoided whenever possible. If motorists used more precaution when arriving at an intersection and if more intersections were signalized, this would be a distinct aid in eliminating this class of accidents.

Map Shows Accidents.—The St. Louis traffic section has developed a spot map showing the number of traffic accidents at the various intersections. This map has served a useful purpose on many occasions for reference after complaints of conditions have been made. Persons living in the vicinity of the scene of an accident at an intersection may feel that an extremely hazardous condition exists there. A reference to the spot map may dispel the fear and show that the accident was due to careless driving.

Standard Signals and Markings

THE generally accepted height for traffic signals above the pavement is between 8 and 10 feet. Signals placed at this height give the best opportunity to the driver to observe and obey them. Signals on pedestals in the center of the intersection are unsatisfactory and dangerous unless on a traffic island amply protected from danger of collision. Signals suspended from mast-arms or from cables over the center of the intersection at a height of about 14 feet above the pavement, always nuisances, are now obsolete and should be replaced as soon as funds are available or when changes are made in the signal system.

Signal Systems.—Not infrequently a number of intersections on a main street may be supplied with traffic signals. Sometimes these are operated together, constituting a signal system, or, if some distance apart, may be operated independently as isolated signals. If two or more signals are within 1,000 feet or less of each other, they should be wired together to operate as a signal system. If the distance between signals approaches 1,200 to 1,500 feet, they cannot be satisfactorily operated as a connected system.

Most frequently, the signal system in the average small community operates at present on what is called a "simultaneous system": all signals facing the main street are green at the one time and all change to red at the one time. This system has serious objections in that traffic moves by a series of starts and stops, and when moving the driver has every inducement to make as much speed as possible in order that he may travel as many blocks as he can before again being stopped.

Changes Easy. — Most simultaneous systems may be easily changed to what is known as the "alternate system," simply by changing the wiring on the lights. When such a change is made, every other signal will then show red or green alternately. When the length of the block is known, definite speeds at which vehicles may pass through the street may be determined and the length of red or green periods so fixed as to permit that speed only, and no greater throughout the length of the system. Drivers will soon learn the speed at which they can make the run through the signal system without stops, particularly if signs are attached to the signals or to the pedestals showing the speed for which the signals are timed.

Objections to Alternate System.—The principal objection to the use of the alternate system of signal installation is that the length of the red and the green signal must be exactly the same in all lights. However, this cannot be a serious problem to the average community, since it has been shown before that the short cycle is most efficient and satisfactory in the majority of cases.

Pavement Markings. — White lines painted on the pavement may safeguard and help the free movement of traffic in numerous ways. Center lines may be painted on the roadway, on curves or at the crest of a hill to divide opposing lanes of traffic. Crosswalks painted at the intersection show the area in which pedestrians may walk with safety. Lane markings dividing the roadway into two, three, four or more lanes may be marked by painting white lines in each direction 50 to 75 feet from the crosswalk. If words are painted on the street surface, elongated letters should be used.

"Stop" lines or limit lines may be painted part-way across the street at the point where a vehicle should stop before entering a "through" highway in obedience to a "Stop" sign.

The boundary limits of a safety zone, when not a platform above the surrounding street surface, may be indicated by paint lines. Parking lines parallel and not more than 6 feet from the curb line will aid in reducing careless parking habits. Where angle parking is permitted, lines painted at an angle to the curb will mark the stalls in which vehicles should park. Curbs are sometimes painted to show prohibited parking or short parking zones. Where curbs are painted for this purpose, yellow or orange is to be preferred.

Safety and Loading Zones.—Safety or loading zones are sometimes necessary at points where a number of pedestrians cross or where a considerable number of people must stand in the roadway to board or alight from street cars. This pedestrian traffic, coupled with a heavy volume of vehicular traffic at high speeds may warrant the use of safety zones or loading islands.

If safety zones are necessary, they should be of permanent type to give the maximum of protection to pedestrians. They should be fully illuminated both day and night with blinker lights and with floodlights at a height of both 4 feet and 12 feet above the road surface, and should be designed with a prow or sloping abutment to turn aside any vehicle that might collide with the safety zone or to decrease the speed of a head-on collision with the least possible danger to the vehicle. If safety zones are established, vehicle traffic should by all means be permitted to pass on both sides of the area.

—From the report of the Highway Research Board's Sub-Committee on Traffic Relations in Municipalities; continued from the January issue.

*"Asking whether we would advise reducing the number of motorcycles in our Traffic Department.**

"We have this to say —

"Experience of recent years unquestionably indicates that it would be very inadvisable to take such a drastic step."

Again, a police commissioner, acting cautiously lest he decide unwisely on an important question, has asked police chiefs in other cities to give him their frank opinions.

Let us quote further from this letter written by the Traffic Captain of one of our largest cities —

"THERE are two major reasons why the use of motorcycles in traffic control has been found to be more efficient than automobiles. First, the facility with which a motorcycle can be handled in congested traffic enables an officer to more adequately enforce our safety measures than would be possible if he were forced to operate a more cumbersome vehicle . . . Second, there is no question regarding the economy of the motorcycle as compared to the automobile; not only in the initial cost but in year-to-year maintenance."

Because you are interested in the true facts about traffic control — accident prevention — you should learn all of the facts about Harley-Davidson Police Motorcycles.

See your nearby dealer or write for special Police literature.

HARLEY-DAVIDSON MOTOR CO.
DEPT. M. MILWAUKEE, WIS.

**Names upon request*

HARLEY-DAVIDSON
The Police Motorcycle

Fallacies Which Handicap State and Local Governments in Attracting High-Grade Personnel

THAT a *career service system* should be established in the various governmental units, Federal, state and local, through enactment and execution of appropriate laws, or through the development of existing personnel or civil service administration, is a major recommendation of the report of the Commission of Inquiry on Public Service Personnel, just published.* The report estimates that the 175,000 units of government in the United States hire 3,250,000 public servants, who receive in salaries some $4,500,000,000 a year.

Among other notable features of the report is a discussion of the profound influence of some common fallacies on the selection of appointive administrative personnel for governmental service, especially in the state and local fields. "The evidence we have taken," says the Commission, "indicates that these wrong ideas, accepted without thought, are in large measure responsible for the failure of our national, state and local governments to attract to the public service their due share of men and women of capacity and character."

The fallacies listed are:

1. *The false notion that "to the victor belong the spoils."*

From this it is inferred that it is right and necessary for a newly elected administration to discharge incumbents regardless of their merit and appoint its own party workers regardless of *their* merit to any salaried posts which can be found, vacated, or created. This was not the doctrine of the fathers of the Constitution. It is a corruption of democracy, introduced into American government between 1810 and 1824. It is of no value to government nor, in the long run, to political parties, and has been abandoned in many parts of the United States, and in most of the democracies of the world.

2. *The mistaken idea that the duties of governmental employees are, as President Jackson said, "so plain and simple that men of intelligence can readily qualify themselves for their performance."*

Whether or not this was true in 1829, it is certainly not true today. On the contrary, certain of those duties are now so difficult, so complex, so technical as to require the recruitment of highly trained specialists and the training in the services of the best administrative talent which the nation produces. Moreover, experience and science demonstrate that men have different physical and mental and moral capacities, and that these differences must be recognized in their education, in their work, and in many of their other relationships, not only from the standpoint of their usefulness to society, but from that of their own happiness as well.

3. *The false idea that charity begins on the public payroll.*

All over the United States men and women are elected or appointed to office or kept on the payroll because they need the job: some one has died, there are twelve children in the family, a leg has been lost, or some other misfortune has befallen them. The employees appointed for these eleemosynary reasons draw the pay while others do the work, or else the work is botched and neglected. The cost to the public is not only the salary involved but also the much larger social cost of poor and bungled service and of lowered morale among the other employees.

4. *The erroneous assumption that "patronage is the price of democracy," that the parties which we need for self-government cannot exist without spoils.*

This fallacy, more than any other, is responsible for the hopeless, defeatist attitude of good citizens, deterring them from advancing to the annihilation of the spoils system. There are, it is true, large cities, certain states, and other areas where political parties and political activity are *at present* sustained by patronage. But in great sections of the United States, and in other democracies of the world, democracy exists, political life is maintained, parties thrive, without the spoliation of the appointive administrative services. The truth is, as Theodore Roosevelt once observed, that patronage is the curse of politics. It is the selling-out price of democracy, because of itself it turns the political party into a job brokerage machine, creating a mercenary army of occupation, which, under the guise of democracy, robs us of self-government.

5. *The idea that "the best public servant is the worst one."*

"A thoroughly first-rate man in public service is corrosive. He eats holes in our liberties. The better he is and the longer he stays, the greater is the danger." Though this was the printed statement of a past president of the United States Chamber of Commerce in 1928, the Commission of Inquiry on Public Service Personnel could find no support for the idea in 1934. Springing in part from the same fallacy, much vilification of public employees as "tax eaters," "payrollers," and "bureaucrats" is, however, indulged in by certain groups in certain areas. The evidence indicates that these groups either are thoughtless or else have selfish reasons for desiring bad government. Indiscriminate vilification lessens the morale of all public officials, dissuades capable persons from entering the public service, and discredits the authority of government. Such efforts to change government through personal abuse of public servants as a class, rather than through the advocacy of specific reform measures, must be recognized as thoroughly subversive. No one who goes through the country from coast to coast examining the public service, as did this Commission, can fail to be impressed by the many evidences of marked ability and loyalty in those who now serve the public. To transfer to these worthy employees the abuse earned by a few bad ones is a most unwholesome piece of demagogy.

6. *The erroneous thought that "tenure is the cure of spoils."*

This was the central idea of early civil service reform, and is the chief objective of certain organizations of public employees. American experience shows that guaranteed tenure for public employees is, when standing alone, a dangerous thing. It tends to produce poor service and low morale, to lessen the standing and prestige of the "protected" classes, to prevent the advancement of efficient personnel, and to keep deadwood on the payroll. It is used in many jurisdictions by the politicians as a dugout for spoilsmen. The evidence presented indicates that tenure should not be established except as a part of the merit system which selects with care those who are to be given tenure, establishes a definite retirement system, and sets up the method of getting rid of deadwood. Responsible employees' organizations both in this country and abroad have not only recognized these facts but have insisted that they cannot afford to ask for the protection of incompetent personnel, as this will not only result in bad service, but will undermine public confidence in all public servants.

7. *The superficial thought that the way to eradicate spoils and favoritism is to begin at the bottom with clerks, stenographers, and policemen, and work up, and that the success of reform can be measured by the percentage of the total service which is placed "under civil service."*

All the evidence presented shows clearly that the top posts are of supreme importance, and that chief administrative officers who are spoilsmen can demoralize the rank and file and wreck the service in spite of any law.

8. *The belief in "home town jobs for home town boys."*

Tariff walls around individual city, county, and state payrolls are a bad thing not only for the public service and the taxpayer, but also for those who desire to work for government. Residence requirements, particularly for technical, skilled, and other higher posts, restrict the opportunity for selection by the employer, that is the government, and they limit the opportunities for a career on the part of the person entering the service. No such restrictions have, as a rule, been imposed with regard to school teachers, nor in private business, and they should not be imposed in connection with other appointive government positions. Residence qualifications are a benefit only to incompetent applicants and petty politicians.

9. *The notion that "the public service is always less capable and efficient than private enterprise."*

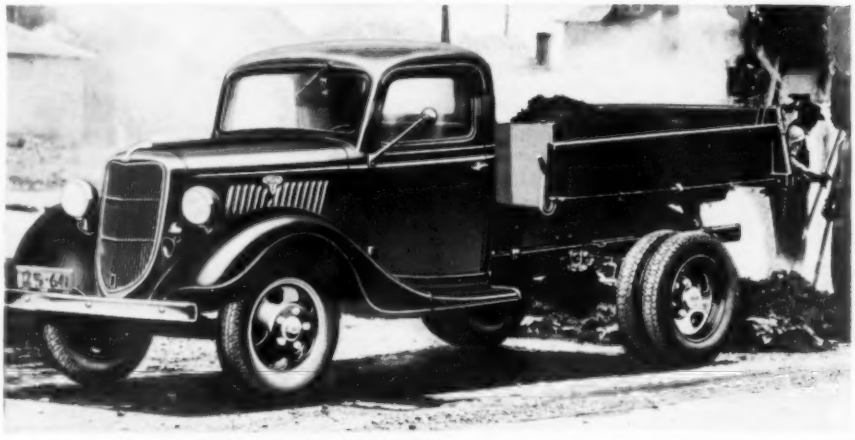
The best businesses are more efficient than the average government; while the most efficient governmental units are more efficient than the average business. At many of the hearings of the Commission the opinion was expressed that businesses and governments are apparently about on a par—what business gains through the profit motive and elasticity being apparently lost in many instances through hereditary management, labor difficulties, and outside control. It was pointed out also that in America governments have, as a rule, undertaken no services except after private agencies have proved themselves incapable or powerless to conduct them. To achieve any measure of success under such conditions is a remarkable accomplishment for public management. Businesses and other private agencies, too, have their problems of nepotism, favoritism, sharp practice, low morality, embezzlement, insolvency, and decay, as well as the difficulties which arise from useless competition. The criticism of the public service arises by comparison not so much with the superiorities of business as with the higher standards which we expect and have a right to demand from our governments.

10. *The erroneous idea that the spoils system, the eleemosynary system, and the other corrosive influences can be driven out of the public service through the prohibition of specific abuses.*

Time and again, the Commission has been told that laws will not cure the situation. What is clearly required is not negative laws, but the positive and militant handling of the problem of personnel with the active backing of the public and the press.

* *Better Government Personnel*, published 1935 by Whittlesey House, New York. See p. 93, this issue.

THE NEW 1935 FORD V·8 TRUCK



One hundred and twenty-five thousand Ford V-8 Trucks in use throughout the world have proved their right to the claim "America's great truck value." Because of this widespread acceptance, the entire production of Ford Truck engines is of the V-8 type.

To the proved design of the Ford V-8 Truck have been added many new features. But from your point of view, the most important question is: "What will this new truck do for me?" Your Ford dealer is ready to answer that question right NOW. He is so proud of this new truck . . . he is so confident of V-8 performance and V-8 economy that he will gladly arrange an "on-the-job" test for you if you are in the market for a new truck. Ask your Ford dealer to let you try a 1935 Ford V-8 Truck with your own loads . . . over your own routes . . . with your own driver at the wheel.

Then ask the price! Such performance and economy at a price so low will convince you once and for all that this 1935 Ford V-8 Truck is now more than ever AMERICA'S GREAT TRUCK VALUE!

PRICES

TRUCKS

131½-inch Chassis	$500
131½-inch Chassis with Closed Cab	595
131½-inch Platform	650
131½-inch Stake	675
131½-inch Panel	760
131½-inch Dump Chassis	530
131½-inch Dump Chassis with Closed Cab	625
131½-inch Dump Truck	800
157-inch Chassis	525
157-inch Chassis with Closed Cab	620
157-inch Platform	690
157-inch Stake	735

COMMERCIAL CARS

112-inch Closed Cab and Chassis	$435
Drive-away Chassis	360
112-inch Panel Delivery	565
112-inch De Luxe Panel Delivery	580
112-inch Sedan Delivery	585
112-inch Station Wagon	670
112-inch Pick-Up	480

(All prices f. o. b. Detroit. Convenient terms through facilities of Universal Credit Company.)

THE ONLY TRUCK AT ANY PRICE THAT GIVES YOU ALL THESE FEATURES

New Cab

Welded all-steel construction. Real passenger-car comfort for the driver. Adjustable driver's seat. Passenger-car-type instruments grouped directly in front of the driver. Safety Glass, standard equipment throughout. Triple ventilation includes: (1) Clear-Vision Ventilation in door windows; (2) easy-opening windshield; (3) large screened cowl ventilator. Seat width increased to 49 inches. Interior of cab completely lined.

New Brakes

Cast alloy iron drums with integral cooling ribs. Drums will not "bell-mouth." No "fading," even when making a series of quick stops in rapid succession. New brake mechanism makes stopping quicker and smoother with heavy loads. Longer life between adjustments.

New Clutch

New design assures much longer clutch life, minimizes slippage and permits smoother engagement. Lower pedal pressure at idling speed. Plate pressure increases as speed of engine increases. Improved ventilation makes clutch run cooler. Diameter increased to 11 inches. Larger frictional area.

Improved Cooling

Larger water pump impellers. Six-blade 15½-inch fan. Wider radiator, 15% more radiating area.

New Crankcase Ventilation System

Directed-flow crankcase ventilation reduces corrosion and oil dilution by removing fumes.

V·8 Performance with 4-cylinder Economy

The Ford V-8 Truck engine develops more than 80 horsepower. Uses no more fuel than a "four." Dual carburetor and dual intake manifold. Light-weight, cast alloy pistons. Exhaust valve seat inserts. Heavy-duty copper-lead connecting-rod bearings.

Low-cost Engine Exchange Plan . . . Full-floating Rear Axle with Straddle-mounted Driving Pinion . . . Full Torque-tube Drive Permits Free-shackling of Semi-elliptic Rear Springs . . . Deep, Rugged Frame with no "Kick-up" . . . Oilless Front Spring Shackles . . . Baked Enamel Finish . . . Deep-skirted Fenders Match Colors of Hood and Cab.

ALSO A NEW LINE OF SMART, FAST FORD V·8 COMMERCIAL CARS

IMPROVING MUNICIPAL ADMINISTRATION

Current Items from the Public Administration Clearing House

City Pay Envelopes Getting Back to Normal

MORE city employees are getting full-sized pay checks today than six months ago, according to reports from 126 cities to the American Municipal Association and the United States Conference of Mayors. Results of the survey, released December 31, show that twelve cities, all of which are 50,000 or more in population, have fully restored pay cuts made in 1930 or later. Four made full restoration within the past six months, and two others—East St. Louis and Boston—made full restoration on January 1. Oklahoma City expects to give out the normal-sized pay checks by the end of 1935.

In 44 cities pay cuts have been or will shortly be restored in part. These cities include Chicago, Detroit, St. Louis, Baltimore, San Francisco and Cincinnati. The partial restorations range from one-tenth to two-thirds of the original amounts cut. Since 1935 budgets are still pending in a number of these cities, it is possible that others may be added.

Sixty-five of the 126 cities have as yet made no move to restore salary cuts, the report shows. Six cities made no pay cuts at all during the depression. These were Albany, N. Y., Reading, Pa., Wilmington, Del., Wilkes-Barre, Pa., Oak Park, Ill., and York, Pa.

"Restoration of pay cuts by cities is generally considered as an evidence of recovery," comments Paul V. Betters, Executive Director of the associations. "The replies from the cities questioned indicate that the movement is gaining momentum—which should be an especially favorable sign."

Double Taxation Not the Whole Tax Conflict

DOUBLE taxation, which to most people means two taxes on the same thing from different sources—Federal and state or two states—is only a part of the problem of conflicting taxation, says James W. Martin, Research Director of the Interstate Commission on Conflicting Taxation. The Commission, set up by the Interstate Assembly representing the various states, which was called together by the American Legislators' Association in 1933, will report results of its subsequent study of conflicting taxation early in 1935.

The general definition of double taxation, Mr. Martin explains, is a duplicate tax levy that discriminates between certain types of taxpayers, whether it is levied by one jurisdiction or by more than one. Thus, double taxation may arise in a single taxing district in the case of a general property tax which defines as taxable property both the stock of a corporation and the realty it owns.

There is a second class of "tax conflict," however, in the technical difficulties arising from the indifference of each taxing jurisdiction to the tax levies of others, Mr. Martin points out. If a corporation does business in a dozen states, it is likely to encounter a dozen-and-one bases for computing capital gains or depreciations. Varying legal interpretations of the same statutory provisions present another aspect of this difficulty.

Competition between various commonwealths for economic advantage—as seen in the recent Florida constitutional provision exempting movie producers from income tax—is a third kind of conflict based on the multiplicity of tax jurisdictions.

A fourth kind of conflict lies in the constitutional provision prohibiting state taxation of interstate commerce. If, for example, a shipment is made from Cincinnati, Ohio, to Cleveland, Ohio, freight tariff receipts of the railroad company are subject to tax. If the same shipment originates in Ludlow, Ky., a mile across the Ohio border, and travels over exactly the same line, Ohio cannot levy the tax.

The most obvious, though not the most serious kind of conflict, Mr. Martin comments, is the cost of maintaining a duplicate state and Federal administration for several kinds of taxes.

Licensing Motor Vehicles Using Diesel Oils

LICENSING of motor vehicles using diesel oils and others of the coarser fuels, vehicles which have thus far been tax-exempt, will be studied by western states taking the advice of the Executive Committee of the Western Motor Vehicle Conference, which met in Phoenix, Ariz., recently.

Trucks and other vehicles using this kind of fuel are increasing in number so rapidly in the western states, the Committee pointed out, that unless their licensing is covered by suitable legislation at the next sessions of the legislatures, many thousands of dollars in possible revenue will be lost during the coming two years.

The Committee recommended that each state study this tax problem in its particular locality promptly and exchange information with the other states of the region. Findings made will be presented at the next meeting of the Western Motor Vehicle Conference, which will take place in the spring of 1935, according to Henry W. Toll, Secretary of the Committee.

The Western Motor Vehicle Conference was established in June, 1934, at a meeting held in Salt Lake City under the auspices of the American Legislators' Association. Eleven western states are represented by administrative and legislative officers in the Conference, which is for the purpose of uniting effort in solving motor-vehicle regulation problems. The states are Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming.

Catching Criminals Over State Lines

THE chase for petty criminals or misdemeanants who jump over state lines is often given up because their offenses are not serious enough to justify the expenses of interstate rendition or extradition, says Major John A. Warner, Superintendent of New York State Troopers, in January *State Government*, official magazine of the American Legislators' Association. But both misdemeanants and felons are hard to apprehend. A few states have amended their laws to simplify a fugitive criminal's return, but because of lack of cooperation of other states, most misdemeanants and many felons continue to enjoy "out-of-state" immunity.

The expense of preparing papers and of traveling to the capital of the state to which the fugitive has fled is one of the major obstacles. Modern interstate police teletype and police radio make it possible to head off a lawbreaker quickly, even out of the state, but the demanding state often fails to secure his return.

Major Warner suggests that legislators and crime commissioners look into the possibilities of the Federal Interstate Compact Act, which authorizes states to enter into agreements which would aid in the prompt return of fugitive criminals. Interstate compacts, in his opinion, should be made broad enough to include interstate rendition upon certification by the demanding state, and might even recognize the authority of out-of-state police officials in the execution of process and apprehension of offenders.

The recent Federal act making it a crime for felons or witnesses in criminal proceedings to flee from one state to another is of considerable help, Major Warner says. He comments, however, that Federal authorities must be called in to arrest the criminals, who may then be tried first on the charge of flight before their violations of state laws are tried.

Outlook for the Gas Tax

Prof. Finla G. Crawford has completed his fourth survey of the gas tax, presented in "The Gasoline Tax in the United States: 1934," issued by Public Administration Service on January 5, 1935. **See page 91, this issue.**

A collision test that proved the *strength* of the Kennedy SAFETOP Fire Hydrant

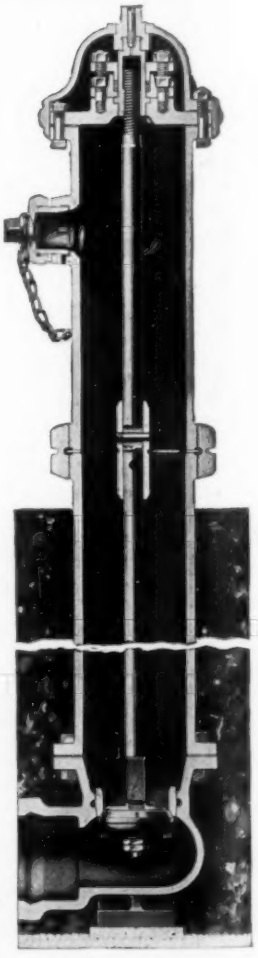
Reg. U. S. Pat. Off.

SOME time ago, a group of water works superintendents and engineers met at Holcomb, N. Y., to witness the result of a collision impact against a Kennedy SAFETOP Fire Hydrant.

In numerous similar tests, the heavy vehicle crashing into the SAFETOP Hydrant snapped the patented Safety Breakable Section cleanly apart.

When preparing for this particular test, however, one factor had been overlooked: The hydrant had been installed only a short time before, and the earth around it was not solid enough to hold the hydrant firmly. When the heavy truck crashed into the hydrant, the impact merely pushed the hydrant over in the soft soil. Lacking the support of a thoroughly firm backfill to hold the lower standpipe section rigidly in place, the sturdy Safety Breakable Section resisted the impact, *proving itself to be fully as strong as the standpipe of other types of hydrants.*

This test, in which the Safety Breakable Section did *not* break, demonstrated conclusively that the Kennedy SAFETOP Fire Hydrant is amply strong to resist a severe impact. Other tests and accidental collisions, where impacts which *no* hydrant could withstand broke the Safety Breakable Section, have proved with equal conclusiveness that the patented Kennedy SAFETOP construction protects occupants of colliding vehicles from serious personal injury, prevents flooding and breakage, and permits placing the hydrant back into service by one man, within half an hour, without excavation, and at a total cost of less than $10.00 for both replacement parts and labor.



The Kennedy Valve Mfg. Company, Elmira, N. Y.

Branches and Warehouses in Principal Cities

KENNEDY SAFETOP FIRE HYDRANT

REG. U.S. PAT. OFF.

Housing Conference Stresses Land Problem

HOW selfish real estate speculators are handicapping efforts to acquire land for housing projects both by the Public Works Administration and by the Interior Department's Division of Subsistence Homesteads, was stressed by several speakers at the National Public Housing Conference, in Washington, January 20.

Discussing "The Great American Delusion," Irving Brant, Editor of the *St. Louis Star and Times*, said in part:

"The Public Works Administration, if it would make its low-cost housing program a success, must beat down and explode the great American delusion of wealth through land speculation. It cannot in morals sanction a price for land based on the dream of commercial or industrial expansion. Nor can it do so in practice, because the people who are to live in these houses cannot pay interest on swollen land values. How can we handle this problem? Some will say, by a national land tax, levied on land but not on improvements. This is politically impossible at this time."

As one possible method of applying locally the power of land-value taxation to reduce land prices in blighted areas, Mr. Brandt made the following suggestion.*

"Let Congress, in appropriating funds for a national housing campaign, grant Federal aid for slum clearance on the following terms:

"That states, to share in the housing fund, authorize the creation of improvement districts in cities, these districts to have the following power:

"To impose a special tax upon the value of land, not including improvements, which tax shall be abated upon any land improved or offered for improvement under terms and specifications approved by the national housing authority.

"For successful operation, this would need the active support of a majority of property owners. Their votes would have the same legal standing as if cast by a majority in an entire city, for the district would be a governmental unit."

Difficulties in land acquisition for subsistence homesteads were stressed at the Conference by Dr. William E. Zeuch, chief of the Subsistence Homesteads Division's Initiation and Planning Section.

"When representatives of the Division attempt to acquire a minimum tract of anywhere from 120 to 1,000 acres, difficulties increase," Dr. Zeuch told the Conference. "To begin with, it is practically impossible to keep such a land hunt confidential. In the majority of cases, although we make every effort to keep the matter quiet, the news gets out and every owner approached thinks at once that an opportunity has come to sell his land to the Government for a price in excess of local market values as determined by fair appraisals. In many instances we have been forced to take options on desirable tracts at far more than their market value or their actual worth for subsistence homesteading. In such instances the actual appraisal of such tracts is far below the option price, and a bickering of land values begins which often extends over weeks and months. Sometimes the owner is so sure he has the one and only tract desired by the Government that he will not budge. Too often this notion is well founded, and the Division of Subsistence Homesteads has been forced to retire from an area for the time being."

"Gum-shoe" purchasing methods and moral suasion have too often failed as devices for acquiring land at fair prices for public works and housing projects. More general use of taxing and zoning powers, and of the right of municipalities to declare unsafe and insanitary buildings uninhabited, is obviously needed.

* Mr. Brant's complete paper is available in pamphlet form on application to the National Public Housing Conference, 112, E. 19th St., New York.

Taxation for Prosperity

A COMMITTEE of the Tax Policy League has formulated a following brief statement of principles of "Tax Policy to Aid Economic Recovery and Permanent Prosperity":

I. Economy in governmental expenditures—national, state and local—should be constructive in nature, not adding needlessly to unemployment, nor forcing the elimination of services essential to the public welfare.

II. Government should always be prepared to take up the slack occasioned by a decrease of business activity by carrying on a vigorous program of public works and services.

III. Balancing of revenues and expenditures—especially by the Federal Government—should be cyclical, not annual. Abnormal outlays should, therefore, be financed mainly by borrowing, with more rapid amortization than heretofore in periods of prosperity.

IV. Increased reliance on graduated taxes on incomes and inheritances and on carefully planned levies upon land values will partially offset the maldistribution of buying power which has been an aggravating factor in the present business depression.

V. Social security for every citizen, financed as far as necessary through the power of taxation, could be made an important factor in assuring nation-wide sustained purchasing power.

VI. The present distress of local governments should be eased through consolidation and reorganization of many local units, through more scientific and more efficient administration of real estate taxes, through carefully devised equalization grants for certain functions having both state and local significance, through increased sharing of state-collected taxes, and through more effective supervision of local fiscal methods.

VII. Personal property taxes, which are administratively unsatisfactory, and general sales and poll taxes, which are regressive in nature and therefore constitute an unfair burden upon the poorer classes, should be abolished as speedily as possible.

VIII. Tax-limiting provisions and uniformity clauses in the state constitutions should be repealed.

IX. There should be much more scientific and mutually helpful coordination than now exists among the tax systems of the Federal, state and local governments.

In an 8-page pamphlet (obtainable at 10 cents per copy or $6.00 per hundred) the special committee of the Tax Policy League has outlined briefly, under nine headings, its reasons for advocating the foregoing policies. The League's office is at 309 East 34th Street, New York.

Recent City Manager Appointments

J. J. CASSADAY, of Fredericksburg, Va., resident engineer of construction and maintenance for the State Highway Department, has been appointed City Manager of Salem, Va., effective January 21, to succeed Roy P. Bishop.

R. W. Hunter has replaced J. M. Price as City Manager of Quitman, Ga.

H. M. Pafford, of the Georgia State Highway Department, was appointed City Manager of Waycross on January 4. Walter E. Lee, who has been City Manager the past year, will resume his former duties as City Clerk and Treasurer.

J. A. Raffield was appointed City Manager of Sumter, S. C., to succeed S. K. Rowland.

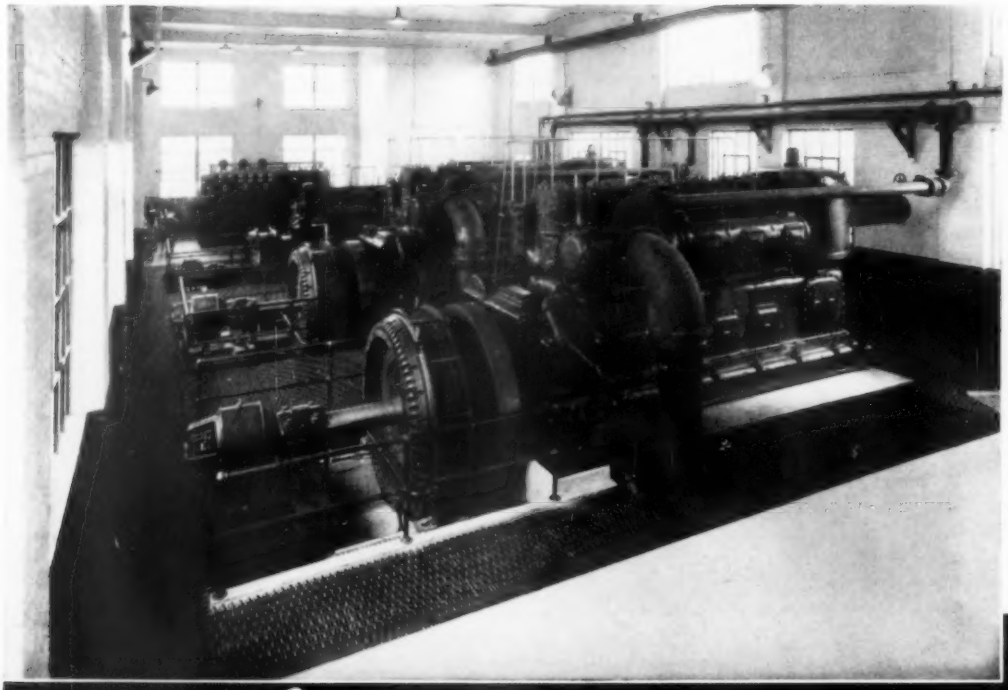
CLARENCE E. RIDLEY,
Executive Director, International City Managers' Association.

The Municipal Bond Market

THE strength of the market for high-grade municipal bonds is indicated by a report of the Public Works Administration last month that "securities which cost PWA $46,784,937 have been sold for $47,520,882, the net premium realized being $735,945. This represents a profit to the Government of 1.6 per cent on bond sale operations to date."

An excellent market for new issues at low interest rates is apparent from the following table of typical sales, compiled from January issues of *The Bond Buyer*:

Amount	Borrower and Purpose	Rate (%)	Term (Years)	Basis (%)
$10,000,000	New Jersey, Emergency Relief	2.5	1-8	2.32
100,000	Cambridge, Mass., Street	2.5	1-10 Ser.	2.38
179,000	Milford, Mass., High School	3	9.83 Avg.	2.79
176,000	Niagara Falls, N. Y., Water-Works Improvements	3	12.333	2.95
600,000	Ramsey Co., Minn., Public Welfare	3	5.83 Avg.	2.97
200,000	Buffalo, N. Y., School	4	5.75 Avg.	3.04
1,078,000	Columbus, Ohio, Sewer	4	8.5 Avg.	3.26
290,000	Shaler Township, Pa., Sewer, Water	3.5	12.64 Avg.	3.42
294,000	Hamilton, Ohio, Water Works	4	23.25	3.45
1,050,000	San Francisco, Calif., Water Distr., Sewer	4	11.64 Avg.	3.58
375,000	Los Angeles Co., Calif., High School	3.75	11.5 Avg.	3.62
2,000,000	Delaware River Joint Commission, Philadelphia-Camden Bridge	4.25	21.16	3.73
280,000	Rock Island, Ill., School	2.5	3.75 Avg.	3.73
155,000	Stockton, Calif., Port Distr.	4	13 Avg.	3.84
3,000,000	Newark, N. J., Funding	3.75	8.5 Avg.	4.02
750,000	Birmingham, Ala.	4.5	17.66 Avg.	4.89



The Oberlin, Ohio, municipal Diesel plant. Two 875-hp. and one 600-hp. two-cycle, pump scavenging Diesels furnish power for this beautiful university town.

"Ohio's finest municipal Diesel power plant" chooses F-M DIESELS

Oberlin, Ohio, municipal power plant equipped with F-M Diesels

"Ohio's finest municipal Diesel plant" in Oberlin was born of a community's struggle to rid itself of costly purchased power when the figures showed the savings possible in the manufacture of its own power.

When in 1933 Oberlin decided to build its own plant and pass on the savings to its taxpayers, it was logical that Fairbanks-Morse Diesels should have been chosen. For in hundreds of municipalities large and small, F-M Diesels had shown the way to economical, low cost power that offered not only low rates but extra savings that could be passed on to aid other municipal projects.

For complete information on how hundreds of cities and towns are making municipal power plants profitable, write Fairbanks, Morse & Co., 900 S. Wabash Avenue, Chicago, Illinois. 32 Branches at your service throughout the United States.

Pioneer Designers and Manufacturers of POWER, PUMPING AND WEIGHING EQUIPMENT 104 Years

FAIRBANKS-MORSE
DIESEL ENGINES

6260-0A98.102

Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Non-Conforming Use

MASSACHUSETTS.—*LaMontagne v. Kenney*, 193 N. E. 9 (Supreme Court, November 27, 1934).—The zoning ordinance of the city of Woburn provides that any lawful use of a building existing at the time of its adoption could be continued although such use was non-conforming, and any existing building devoted to such a use might be altered and its uses changed to any use not more detrimental to the character of the district in which it was situated.

Under this ordinance the city issued a permit for the operation of a melting and rendering establishment in a building in a residential district previously used as a tannery. The lower Court found as a fact that the new use was not more detrimental to the character of the district than the old; and that finding cannot be challenged in this Court, but must be considered correct.

This action is brought to revoke this permit, on the grounds that the zoning statute under which the ordinance was passed could not lawfully be interpreted so broadly as to permit such an ordinance. This Court, however, finds that the statute was properly interpreted by the city in enacting the ordinance: that this ordinance is valid; and that the permit allowing the change of use must stand and remain in force.

Fire Hazards

NEW YORK.—*Matter of Taub*, Supreme Court, Kings County, reported in *New York Law Journal*, December 29, 1934.—This is an action of mandamus to compel the Fire Commissioner to issue a permit; with relation to which the Court says:

"It appears that the petitioner applied to the Fire Commissioner for a permit to store fifteen 1-ton cylinders of chlorine gas at the petitioner's premises, on Laurel Hill Boulevard, Long Island City, borough of Queens. The Fire Commissioner investigated the subject of the application, and later plans and specifications were submitted by the petitioner for his approval. The plans were referred to the Board of Hazardous Trades, an advisory board of the Fire Department, and after their investigation they recommended that a permit be issued upon certain safeguards being provided by the petitioner. The Fire Department issued an order embodying the recommendations of said Board and providing the specifications upon which a permit would be granted. The petitioner filed plans with the Fire Commissioner, but they were rejected. An appeal was thereupon taken to the Board of Standards and Appeals, and that Board unanimously affirmed the decision of the Fire Commissioner upon condition that the petitioner make certain modifications in his building plan.

"The petitioner then complied with the determination of the Board of Standards and Appeals and constructed a building at some expense, and received a certificate of occupancy from the Superintendent of Buildings and the Commissioner of Buildings of the borough of Queens, New York City. The petitioner, having passed the necessary examinations, received a certificate of fitness from the Fire Department, which certified to his qualifications for the handling of chlorine gas.

"The petitioner now requests that the formal permit be issued by the Fire Commissioner. The Fire Commissioner refuses to issue this permit on the ground that 1-ton containers are more dangerous than 100- and 50-pound containers, and therefore this application for a mandamus order is made.

"While I am not convinced by the testimony that the 1-ton containers are more hazardous than the 100- and 50- pound containers, I do not deem it proper for the Court upon this motion for a mandamus to substitute its judgment for that of the Fire Commissioner. Nor do I find that the certificate issued by the Superintendent and Commissioner of Buildings of the borough of Queens is binding upon the Fire Commissioner so as to make it mandatory for him to issue the permit requested herein. Nor do I find that the said certificate is binding upon the Fire Commissioner on the question of hazard . . . I do find, however, that the original application to the Fire Commissioner, the appeal taken to the Board of Standards and Appeals, and the present application for the final permit are one application. The Fire Commissioner exercised his discretion when the matter first came before him on the original application. At that time he issued an order permitting the storage of 1-ton containers of chlorine gas and, that order having been appealed to the Board of Standards and Appeals, the determination of the said Board is final and binding upon the Fire Commissioner, since it is conceded that the petitioner first fulfilled all the requirements of the Fire Commissioner's original decision as approved and modified by the Board of Standards and Appeals. The present application for a permit does not involve the exercise of discretion upon the part of the Fire Commissioner. The issuance of the permit becomes a ministerial act in carrying out the orders of the said Board and therefore the order of mandamus applied for herein should be granted.

"It is true that the permits issued are revocable and the Fire Commissioner is not required to renew them. But the petitioner, having complied with the decision of the Fire Commissioner and the Board of Standards and Appeals at some expense, is at least entitled to have his original permit granted to him. Should the Fire Commissioner then decide that such permit should be revoked or that it should not be renewed, he can take such action as he is empowered by law to take. At this time, however, the petitioner is entitled to his permit."

EDITOR'S NOTE.—This is not a zoning case, but is given practically in full as an illuminating illustration of the interrelation of the powers of various authorities in a large city with which zoners and planners must deal.

Nuisance

NEW YORK.—*Beckmann v. Talbot*, 264 N.Y.S. 193 (Supreme Court, Appellate Division, May 5, 1933).—A petroleum products storage tank which would constitute a nuisance at its proposed location could be entirely excluded under the zoning ordinance or permitted under such regulations as the village might impose; notwithstanding other tanks of the same general nature had been located in the vicinity before the ordinance was adopted.

Curb Cuts

NEW YORK.—2675 *Daley Avenue Inc. v. Fassie* (Supreme Court, New York County, reported in *New York Law Journal*, November 2, 1934).—This Court cannot determine the issue whether the curb cut in this case will endanger pedestrians. The defense has been overruled many times as to neighborhoods where one would think more danger exists, but the question must be decided for each new neighborhood by a trial court and not by affidavits.

EDITOR'S NOTE.—See in this connection these Notes for April, 1934. A curb cut is often essential to an outdoor garage; with relation to which see these Notes for October, 1934.

Parking

PENNSYLVANIA.—*James Rees and Sons Co. v. City of Pittsburgh*, 175 Atl. 420 (Supreme Court, November 26, 1934). Under a statute authorizing the city to open a public way and providing that the space between it and the river should forever be used as a public landing, the right of the public to use this wharf in connection with river trade was paramount to that of the city to use the space for parking automobiles; but so far as not needed for that purpose the city can use the space for parking, charging a daily storage fee.

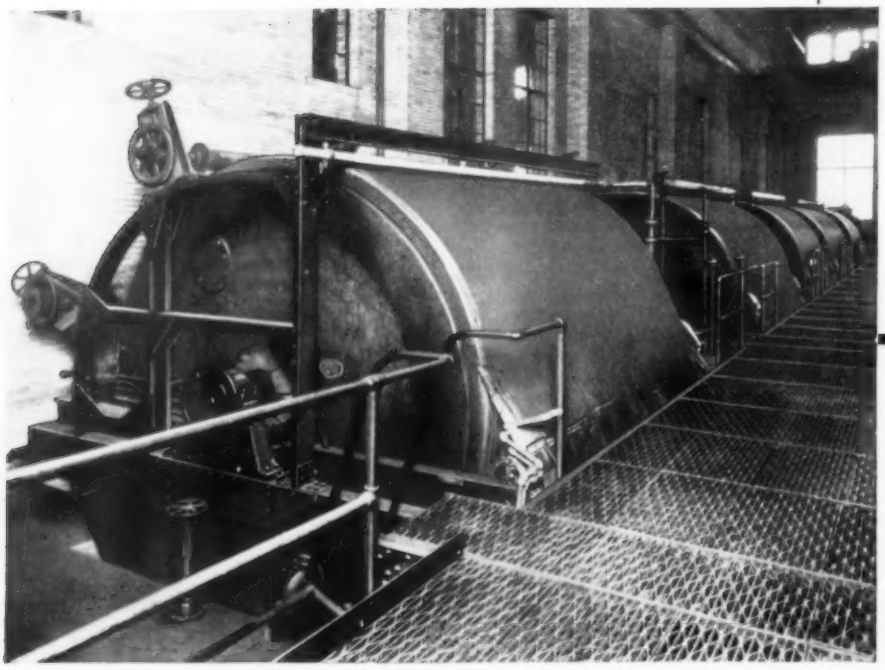
THE CURRENT ISSUE OF THE MUNICIPAL INDEX

contains, on page 119, a condensed index of the legal decisions on zoning and city planning presented in 1933 in The American City.

FERRIC CHLORIDE

The following cities have adopted Ferric Chloride as their sludge conditioning agent:

MILWAUKEE, WIS.
ROCKFORD, WIS.
CHICAGO, ILLINOIS
(*West side experimental plant*)
COLUMBUS, OHIO
SPRINGFIELD, OHIO
ANNAPOLIS, MD.
HAGERSTOWN, MD.
HIGH POINT, N. C.
GASTONIA, N. C.
CHARLOTTE, N. C.



Photograph courtesy of Milwaukee Sewerage Commission...First plant to use Ferric Chloride in sludge dewatering.

THE use of Ferric Chloride as a sludge conditioning agent is rapidly growing in popularity. It has been proven to be the most effective conditioner for activated sludge prior to vacuum filtration.

The Pennsylvania Salt Manufacturing Company was the first company to produce Ferric Chloride in a form suitable for use in sewage disposal plants at a cost within the range of economical sludge disposal operations.

LIQUID FERRIC CHLORIDE was developed first. Today large plants with railroad sidings find it economical and practical to buy it in this form...because it is shipped direct in rubber lined tank cars.

Sewage plants without railroad sidings are now using Ferric Chloride in Anhydrous form...another development made possible by the Pennsylvania Salt Manufacturing Company.

ANHYDROUS FERRIC CHLORIDE comes in powder form. It is packed in airtight, non-returnable steel drums...Is instantly soluble...And can be stored indefinitely without deterioration or liquification.

Our specialized technical service is available without cost to adapt our products to customers' requirements.

WRITE TODAY *for Free Booklet on the application of Ferric Chloride . . . How and where to use it*

Est. 1850 PENNSYLVANIA SALT MFG. CO.

EXECUTIVE OFFICES, WIDENER BLDG., PHILADELPHIA, PA.
Branch Sales Offices: New York—Chicago—St. Louis—Pittsburgh—Tacoma—Wyandotte

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Accidents

Municipality renting part of public building for lodge meetings held liable for injury to visitor falling into unguarded cellarway (New Hampshire Supreme Court: *Douglas v. Hollis*, 172 Atl. 133).

City held liable for injury to child on municipal playground injured through falling upon jagged stone on ground beneath swing (Pennsylvania Supreme Court: *Paraska v. City of Scranton*, 169 Atl. 434).

Volunteer fireman's administratrix held entitled to recover for his death due to negligent operation of fire truck (New York Supreme Court, Appellate Division: *Ottman v. Incorporated Village of Rockville Center*, 271 N. Y. Supp. 391).

Business Regulations

Ordinance forbidding skating rinks held void (Florida Supreme Court: *Inglis v. Rymer*, 152 So. 4).

Statutory authority for municipal regulation of oil wells within city limits held restricted to safety measures, etc., and not to permit restriction of production as a conservation measure, etc. (Oklahoma Supreme Court: *Indian Territory Illuminating Oil Co. v. Larkins*, 31 Pac. 2d, 608).

Ordinance regulating barber shops held void for unjustly exempting beauty shops (Nebraska Supreme Court: *Ernesti v. City of Grand Island*, 251 N. W. 899).

Charter Elections

Petition for election to choose commission to frame charter held valid although consisting of separate instruments filed at different times and although some signatures were written with pencil, some were written by other persons at the instance of the ostensible signers, and some were not accompanied by specification of voting residence (Texas Court of Civil Appeals: *Lantron v. Robinson*, 70 S. W. 2d, 820).

Cigarette Sales

Ordinance forbidding sales of cigarettes by dispensers of narcotics, etc., upheld (Nevada Supreme Court: *Ex parte Nash*, 26 Pac. 2d, 353).

Civil Service

Charter provision placing certain employees in civil service and prohibiting salary reduction upheld (Florida Supreme Court: *Shelby v. City of Pensacola*, 151 So. 53).

Employees whose resignations were obtained through coercion or misrepresentation held entitled to reinstatement, but not to an adjudication in a mandamus proceeding of their right to compensation during the period of removal (Ohio Supreme Court: *Williams v. State*, 188 N. E. 654).

Contracts

Sewer contractor held to have assumed risk of materials encountered. Written contract subject to award to lowest bidder held not alterable during performance. Restricting hours for blasting to period between 6 A. M. and 11 P. M. held reasonable (Missouri Supreme Court: *United Construction Co. v. City of St. Louis*, 69 S. W. 2d, 639).

Surety for contractor is bound by provisions of contract and specifications forming part thereof although ignorant of the same (Kentucky Court of Appeals: *Fidelity & Deposit Company of Maryland v. Board of Councilmen, City of Frankfort*, 70 S. W. 2d, 685).

Court condemns repudiation of municipal obligations on bare technicalities but denies right to recover on implied obligation to pay where suit is brought on an unauthorized express contract (Texas Court of Civil Appeals: *City of Mission v. Eureka Fire Hose Manufacturing Co.*, 67 S. W. 2d, 455).

Covenant assumed by city to deliver water from septic tank in exchange for easement held not to impose perpetual obligation (Texas Court of Civil Appeals: *Stevenson v. City of Abilene*, 67 S. W. 2d, 645).

Town held entitled to recover full damages from contractor for disintegration of curbing due to defects that were latent when job was accepted, although contract required contractor to keep curbing in condition for but one year (New York Supreme Court, Appellate Division: *Town of Tonawanda v. Stapell, Munn & Beals Corp.*, 270 N. Y. Supp. 377).

Council Votes

Majority vote held required to discontinue arc light, although question rose on motion to reject committee recommendation of discontinuance (Florida Supreme Court: *Williamson v. State*, 151 So. 51).

Councilman held disqualified to vote on question of accepting his resignation (New Jersey Supreme Court: *Stevens v. Haussermann*, 172 Atl. 738).

Culverts

If city did not use due care to keep culverts under street free from obstruction, it was liable for resulting overflow of adjacent property (Mississippi Supreme Court: *Cain v. City of Jackson*, 152 So. 295).

Depositories

On liquidation of bank, municipality held entitled to impress trust against funds to extent that treasurer made deposits in excess of amount of bond, but not against other bank deposits received after depletion of trust fund (Illinois Supreme Court: *People v. People's State Bank of Maywood*, 188 N. E. 853).

Bank held entitled to offset against village deposit village debt (Ohio Supreme Court: *State v. Fulton*, 190 N. E. 383).

Ordinances

Under statute requiring ordaining by the "board of trustees" of a specified "town," an ordaining by the "city council of the city of" that name is void (Colorado Supreme Court: *Reimer v. Town of Holyoke*, 27 Pac. 2d, 1032).

Ordinance enacted by referendum held not repealable by city council (Washington Supreme Court: *State v. City of Seattle*, 28 Pac. 2d, 1020).

Single arrest for violation of ordinance, and threats of other arrests, held not to sustain suit to enjoin enforcement of ordinance as being unconstitutional (Indiana Supreme Court: *Lickey v. City of South Bend*, 190 N. E. 858).

Public Utilities

City held empowered to tax public utilities for use of streets without local franchise (United States District Court, District of Oregon: *City of Portland v. Pacific Telephone & Telegraph Co.*, 5 Fed. Supp. 79).

Repeal of necessity for Corporation Commission's approval of new power plant to compete with existing plant held not violative of rights of owner of existing plant (United States Circuit Court of Appeals, Eighth Circuit: *City of Paragould v. Arkansas Utilities Co.*, 70 Fed. 2d, 530).

Electric company held without right to change rate schedules fixed under contract with city without order of Public Utilities Commission (Ohio Court of Appeals, Defiance County: *City of Defiance v. Toledo Edison Co.*, 190 N. E. 781).

Slot Machines

Ordinance classifying types of slot machines and levying higher tax on those dispensing slugs, etc., in excess of value of goods represented by coin inserted, upheld (Florida Supreme Court: *Jackson v. O'Connell*, 154 So. 697).

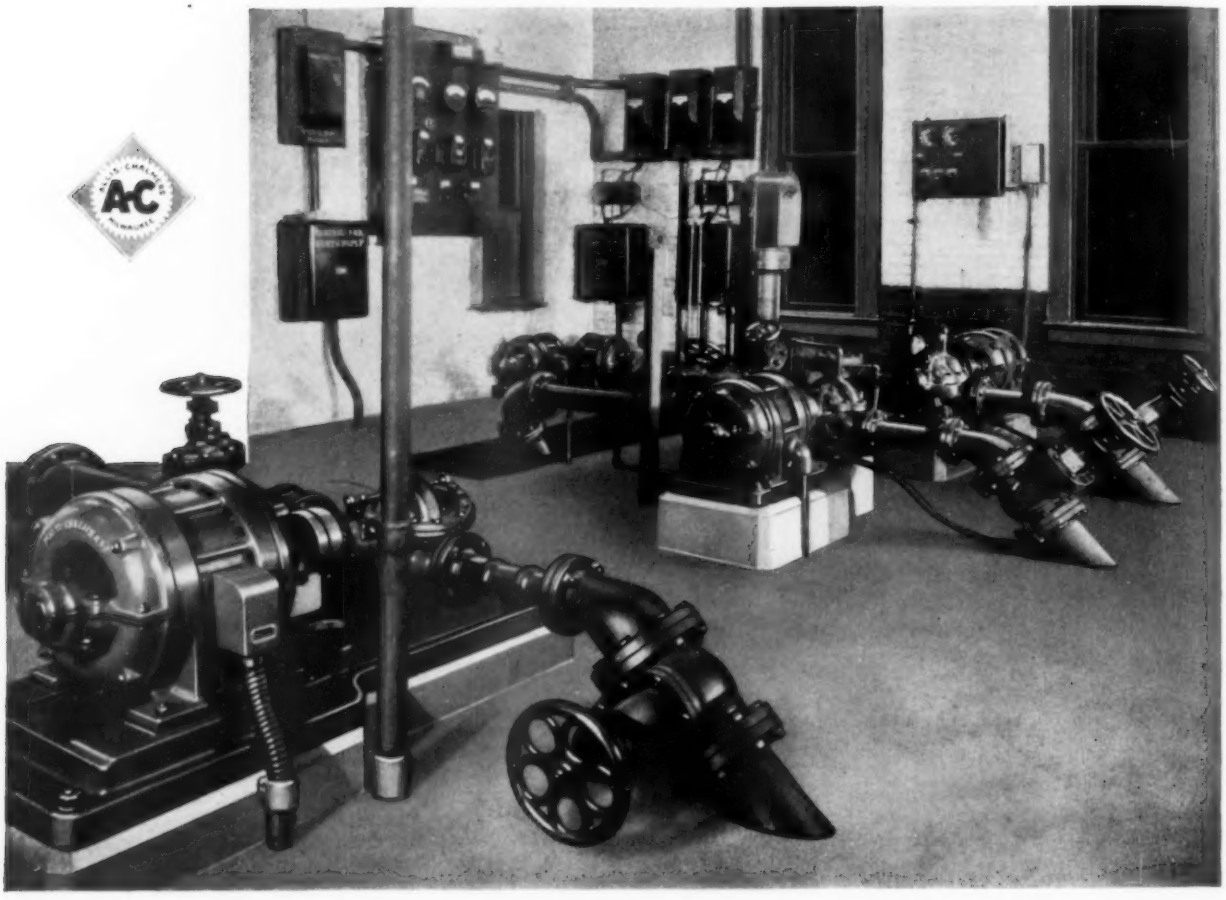
Ordinance forbidding operation of slot machines returning coins or slugs or more or less merchandise than purported, upheld (Ohio Supreme Court: *Myers v. City of Cincinnati*, 190 N. E. 569).

Special Improvements

Private leasehold in public lands held subject to special assessment (Mississippi Supreme Court: *Lord v. City of Kosciusko*, 154 So. 346).

Objections to preliminary proceedings held waived by signing petition, paying assessments and delaying objections (North Carolina Supreme Court: *Town of Wake Forest v. Holding*, 174 S. E. 296).

Another City Lowers Pumping Costs with Allis-Chalmers Centrifugal Pumps



THE three high service Allis-Chalmers Type "S" centrifugal pumping units materially contribute to the lowering of operating costs for the Orrville, Ohio Water Works System. These units on account of their high efficiencies use less electric current than is used in most water works stations of equal size. These savings have been used to decrease their bonded indebtedness and to reduce the rates charged to consumers.

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Allis-Chalmers double suction single stage Type "S" pumps are described in Bulletin 1650A, a copy of which will be sent you upon request.

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MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated

Metering of Water Supply

THE AMERICAN CITY has always been deeply interested in the metering of water as the only equitable sales method which will produce adequate revenue with proper rates. Much information has been published during several years in this magazine and The Municipal Index on water rates; the latest data—new rates for 237 cities—appeared in these publications in 1934, and are reprinted in a pamphlet of 64 pages, issued January, 1935, under the title, "Water Rates and Service Charges, Installation Charges, Hydrant Rentals and Sprinkler Costs." $1.00. (Apply to THE AMERICAN CITY.)

Water Supply and Treatment

A booklet of 143 pages, illustrated with views and diagrams, on the subject of "Water Supply and Treatment," has been prepared by Charles P. Hoover, chemist in charge of the water softening and purification plant at Columbus, Ohio, and published by the National Lime Association, 927 15th St. N. W., Washington, D. C. The various divisions of the discussion are: sources of water supply; methods of water purification; coagulation and sedimentation; filters and filtration; disinfection or sterilization; tastes and odors; prevention of red water and corrosion; water softening; chemistry of lime-soda ash process of water softening; softening water for municipalities; recarbonation of lime softened water; zeolite process of water softening; treatment of boiler feed water; treatment of water for ice, brewing and other uses; methods of analysis. (Apply to the Association.)

Planning

The New York State Planning Board has issued a preliminary summary report of its work and findings for the first nine months. The Chairman of the Board is A. R. Mann; the Planning Consultant, Robert Whitten. The report is presented in 92 photo offset typewritten pages, illustrated with reproductions of 40 charts. The various divisions of the Board's work included cover: population growth; land use; forests; the public domain; water resources; mineral resources; highways; timing and financing of public works; recreation; housing and local planning. The closing section discusses state planning objectives and administration. (Apply to New York State Planning Board, Albany, N. Y.)

Bridges

"Analysis of Rigid Frame Concrete Bridges" is a 40-page illustrated pamphlet published December, 1934, by the Portland Cement Association, in an enlarged edition, with many new features, including results of recent studies. The brief, clear presentation is complete enough to enable bridge designers to analyze rigid frame bridges quickly. (Apply to Portland Cement Association, 33 W. Grand Ave., Chicago, Ill.)

State and Municipal Liability

A tentative draft of a possible state act for the settlement of claims against the state and its subdivisions on account of property damage, personal injury or death, is presented in an article on "State and Municipal Liability in Tort—Proposed Statutory Reform," by Edwin M. Borchard, Hotchkiss Professor of Law, Yale University, available as a reprint from the December, 1934, issue of the *American Bar Association Journal*. This proposed legislation is designed to distribute risks of public administration more fairly without overburdening the treasury. Professor Borchard's illuminating paper discusses the distinction between "proprietary" and "corporate" functions, and points out some of the factors which are helping to break the bonds of the outworn doctrine of sovereign irresponsibility.

Taxation

"Sales or Gross Income Taxes—Arguments for and Against" is the title of Bulletin No. 2 (January, 1935) issued by the Minnesota Institute of Governmental Research, St. Paul, Minn. The definitions of "retail sales taxes," "general sales taxes," "gross receipt taxes," "gross income taxes," and other sales tax terms, as stated in section II, give much-needed illumination. History and experience with these taxes are recounted, including the influences which brought them about. There is a section on "Administration, Shifting, Burden and Yield," and a discussion of the prospects for the sales tax precedes a statement of the arguments of proponents and opponents. 30 pp. (Apply to the Institute.)

A study of municipal participation in highway funds entitled "How Should Cities Share in Special Motor Taxes" has been issued by the National Highway Users Conference, as No. R2, Highway User Series, December, 1934. All uses of city streets are examined to determine justifiable allocation of special motor taxes for the benefit of cities; also the extent to which cities already receive financial benefit from motor vehicles; the relative motor-vehicle use of urban streets and rural highways; and the broad principles involved in a city-sharing policy. 15 pp. 25c. (Apply to National Highway Users Conference, National Press Bldg., Washington, D. C.)

"The Gasoline Tax in the United States: 1934," by Prof. F. G. Crawford of Syracuse University, recently published by Public Administration Service, is a completely revised fourth edition of a pamphlet which in its earlier editions has come to be recognized as the authoritative compilation of facts about the gas tax. The new edition tells what legislative measures have been adopted to stamp out the evil of gas-tax evasion, and how these measures have worked; also how the more progressive states have drastically cut down exemption and refund claims; what distribution of the proceeds of the gas tax each state now makes, and what the organized demands of the cities are. 46 pp.; 19 tables. 50c. (Apply to Public Administration Service, 850 E. 58th St., Chicago, Ill.)

Arguments for and Against "Feasibility of Blanket Tax Limitation Laws as a Means of Reducing the Tax Burden on General Property in Minnesota" have been issued in a 24-page bulletin (December, 1934) by the Minnesota Institute of Governmental Research, St. Paul, Minn. The national movement to reduce property taxes is analyzed, and the history and experience of other states with tax limitation laws is considered in throwing light upon Minnesota's present and future policy. (Apply to the Institute.)

Tax rates and operation statistics for the 581 cities, the 581 city schools and the 105 counties of Kansas are given in the "1934 Tax Rate Book" published by the League of Kansas Municipalities, Lawrence, Kans., as Bulletin No. 102, December 20, 1934. The data are given in tables, with comment. 50 pp. $1.00 a copy; 3 copies for $2.50. (Apply to the League.)

The Harvard Engineering School has reprinted as its publication No. 133, 1934-35, from the Journal of the Boston Society of Civil Engineers (October, 1934) a paper on "Economic Taxes vs. Government Taxes—an Engineer's View of Taxation," by Lewis Jerome Johnson, Professor of Civil Engineering, Harvard University. Professor Johnson's thesis is that "economic law levies taxes more fairly, expediently and fruitfully than the wisest government can hope to do," and that if government would merely harvest this vast fund of "economic taxes," discontinuance of "government taxes" could be achieved and economic order result.

Liquor Control

A New Deal in Liquor: A Plea for Dilution.—By Yandell Henderson, Professor of Applied Physiology, Yale University. Also a reprinting of An Inquiry into the Effects of Ardent Spirits upon the Human Body and Mind, by Dr. Benjamin Rush.—Doubleday, Doran & Company, New York. 1934. 239 *pp.* $2.00 *from* THE AMERICAN CITY.

After stating reasons why Americans, in distinction from other peoples, become addicted to highly intoxicating forms of alcoholic drinks instead of finding satisfaction in milder beverages, Professor Henderson reviews the history of private and public dealings with liquor and their results upon individuals and nations. He recommends as wise public policy encouragement of reinforced wines as appetizers, thus bringing their alcoholic content down to 15 to 18 per cent by volume; and also encouragement of consumption of spirits that have been diluted at the distillery down to 12 to 15 per cent of alcohol by volume; doing this, not by means of prohibitions, but by high taxes on all liquors containing over 20 per cent of alcohol, and relatively low taxes on reinforced wines suitable for mild appetizers, with no state tax and only a low Federal tax on whisky diluted to 12 per cent of alcohol at the distillery.

A report prepared for the Committee on Liquor Control Legislation of the National Municipal League, on "Liquor Taxes and the Bootlegger," by Dr. Paul Studenski, Associate Professor of Economics, New York University, has been published by the League as a supplement to the January, 1935, issue of the *National Municipal Review*, in somewhat abbreviated form. From the facts presented by Dr. Studenski the Committee accepts as the main conclusion that the combined Federal and state taxes on hard liquor and on imported beverages are so high under existing conditions as to immensely increase the difficulty of suppressing the illegal alcohol trade, through which it is estimated that the Federal treasury is losing at least $90,000,000 a year, and state and local governments $45,000,000. The Committee's recommendations for "plugging more effectively the bootlegger leak in revenue" are stated. 20 pp. (Apply to the League, 309 E. 34th St., New York.)

Public Welfare Administration

A digest of recent opinion in the fields of social work and public welfare administration has been compiled under the title, "Looking Toward a Public Welfare Plan," by Russell H. Kurtz, of the Charity Organization Department of the Russell Sage Foundation, in a pamphlet of 34 photo offset typewritten pages. These expressions of various leaders in the welfare field give evidence of "the present drive toward modernization of the welfare machinery," which seems likely to involve a decisive contest "between those who would welcome a return to the laissez-faire days of unintegrated local welfare administration and those who believe that the time has come to work out a truly national welfare plan." 25c. (Apply to Charity Organization Department, Russell Sage Foundation, 130 E. 22d St., New York.)

The story of how the nation's vast welfare service is being interpreted to the public is the subject of a special number of the *News Bulletin* of the Social Work Publicity Council for December, 1934. This special issue, says the Council, "describes actual accomplishments in interpretation, discusses the defensive attitudes forced on public agencies by criticism, and gives examples of the frank and readable participation in interpretation by groups of citizens. The section on what private agencies say about governmental service at campaign time is of particular interest to every social agency." 17 mimeographed pp. Single copies, 25c; annual subscription, $2.00. (Apply to the Council, 130 E. 22d St., New York.)

"Our State Test was Unsatisfactory—

however, since using HTH, we have State approval based on tests of bacteria content, color and taste."

An interview with James J. Buchanan, chairman, Water Commissioners, Town of Northborough, Mass.

A FEW months ago, the Town of Northborough, Massachusetts, incorporated in the year 1766, found itself faced with a serious water supply problem. As in many similar towns, the water system was out of date and State tests showed the quality of the supply to be unsatisfactory. Yet the volume of water handled did not justify any considerable investment in treating equipment.

Here's how James J. Buchanan, chairman of the Water Commissioners, describes the problem and what he did to solve it with a minimum expenditure: "Our conditions were particularly bad at the time that we started the use of HTH," Mr. Buchanan says. "We have a gravity system with no filter and due to past neglect and the age of the system, which employs concrete mains laid over 50 years ago, our State test was unsatisfactory."

"Since the installation of a Chlor-O-Feeder, however, and the use of HTH in its operation, we have changed a very bad condition to one in which we now have State approval based on tests of bacteria content, color and taste. We find also that our pipe system is gradually clearing of the slime accumulation of years and we attribute this also to the use of HTH."

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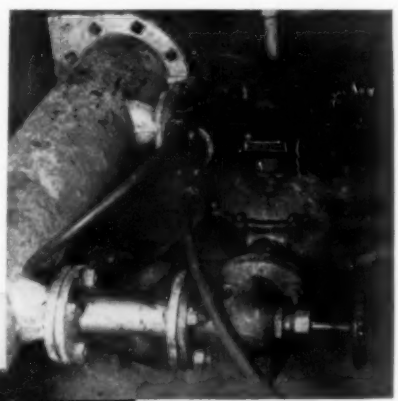

Chlor-O-Feeder installation at Northborough, Mass. feeding HTH solution in step with flow of water. The equipment is installed underground, tapped into an open main on a cement pipe 52 years old.

Reservoir supplying water to the Town of Northborough, Massachusetts.

Public Service Personnel

The Commission of Inquiry on Public Personnel (302 E. 35th St., New York), of which L. D. Coffman is Chairman, and Luther Gulick, Director of Research and Secretary, has just issued its report, "Better Government Personnel," recommending the career system for employees of Federal, state and local governments. The Commission was appointed late in 1933 by the Social Science Research Council, composed of seven national professional societies in the social science field. The inquiry was confined to the appointive administrative services, where the great bulk of government work is carried on; it therefore did not include elected legislators and councilmen, boards and commissions, mayors, governors, or the judiciary and military forces. Specific measures for immediate adoption are urged, and general recommendations dealing with the broad aspects of the program. The public will be benefited by lower costs and efficient, impartial work resulting from a career service program; the government worker, properly trained and educated, will have an honorable career with adequate pay and pension, without political contributions and partisan work; civil service commissions can carry on a positive career service system under modern personnel administration. Such a system rests on the American doctrine of equal opportunity. X + 182 pp. $2.00. (Apply to the publishers, Whittlesey House, McGraw-Hill Book Co., New York.)

Government and Administration

A catalog of "Municipal Training Schools in New York State" presents the training school plan for twenty groups of municipal officials adopted by the New York State Conference of Mayors and Other Municipal Officials in April, 1931, discontinued, for financial reasons, during the year 1933, and resumed in full schedule on January 1, 1934. The plan provides for training *in service;* the municipality is responsible for the training facilities and their expense, and the municipal officials, with cooperating agencies, for training. The facilities and standards are created and maintained by the municipalities through the Conference and its Bureau of Training and Research. No fees are required for any purpose whatever in connection with these schools. This program "is in effect a Municipal University." 112 pp. $1.50. (Apply to Bureau of Training and Research, New York State Conference of Mayors and Other Municipal Officials, Albany N. Y.)

Forestry

The Proceedings of the annual meeting of the National Shade Tree Conference, held in Pittsburgh, Pa., August 30, 31, 1934, have been published, at $1.00 a copy. The booklet contains valuable material on the control of shade tree insects, on soil acidity and plant growth, on the gypsy moth situation, the Dutch elm disease, and other sections of the work and interest of the Conference. 153 pp. (Apply to the Secretary of the Conference, R. P. White, New Jersey Experiment Station, New Brunswick, N. J.)

Other Reports Received

ALAMEDA, CALIF.—Annual Report, City Manager, 1933-1934: Civic Affairs of the City. 103 pp.

CHICAGO, ILL.—Annual Report, Department of Public Works, 1933. 341 pp. (Send 15c in stamps, for mailing, to Municipal Reference Library, City Hall.)

CHICAGO, ILL.—Annual Message, President, Board of Commissioners of Cook County, Ill., 1934. 94 pp. (Send 5c in stamps to Municipal Reference Library, Chicago.)

CHICAGO, ILL.—Annual Message, Forest Preserve District of Cook County, 1934. 37 pp. (Send 3c to Municipal Reference Library, Chicago.)

CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

FEBRUARY 6-8.—INDIANAPOLIS, IND. (200)
National Paving Brick Association. Annual meeting. Managing Director, G. F. Schlesinger, 1245 National Press Building, Washington, D. C.

FEBRUARY 7.—CHARLOTTESVILLE, VA. (200)
Virginia State Chamber of Commerce. Annual meeting. Managing Director, LeRoy Hodges, 708 Grace-American Building, Richmond, Va.

FEBRUARY 12-14.—ANN ARBOR, MICH. (500)
Conference on Highway Engineering—University of Michigan. Annual convention. Secretary, R. E. Morrison, University of Michigan, Ann Arbor, Mich.

FEBRUARY 13-15.—BALTIMORE, MD. (500)
Association of Highway Officials of North Atlantic States. Annual convention. Secretary-Treasurer, A. Lee Grover, Secretary, State Highway Commission, Trenton, N. J.

FEBRUARY 18-21.—CHICAGO, ILL.
National School Supplies and Equipment Association. Annual convention. Executive Secretary, J. W. McClinton, 176 West Adams Street, Chicago, Ill.

FEBRUARY 19-21.—NEW YORK. (350)
American Concrete Institute. Annual convention. Secretary, Harvey Whipple, 641 New Center Building, Detroit, Mich.

FEBRUARY 20-22.—LAWRENCE, KANS. (125)
Kansas Water and Sewage Works Association. Annual meeting. Secretary-Treasurer, E. Boyce, State Board of Health, Lawrence, Kans.

FEBRUARY 21-24.—WASHINGTON, D. C.
The Public Ownership League of America. Biennial meeting. (Willard Hotel.) Secretary, Carl D. Thompson, 127 North Dearborn Street, Chicago, Ill.

FEBRUARY 23-28.—ATLANTIC CITY, N. J. (7,000)
National Education Association—Department of Superintendence. Annual convention. Executive Secretary, Sherwood D. Shanklin, 1201 16th Street, N. W., Washington, D. C.

MARCH 7-8.—INDIANAPOLIS, IND. (100)
American Water Works Association—Indiana Section. Annual meeting. Secretary-Treasurer, B. H. Jeup, 201 State House Annex, Indianapolis, Ind.

MARCH 21-22.—TRENTON, N. J. (300)
New Jersey Sewage Works Association. Annual meeting. (Stacy-Trent Hotel.) Secretary, John R. Downes, Bound Brook, N. J.

MARCH 27-29.—LONDON, ONT.
American Water Works Association—Canadian Section. Annual meeting. (Hotel London.) Secretary-Treasurer, Dr. A. E. Berry, Ontario Department of Health, Parliament Buildings, Toronto, 5, Ont.

MARCH 27-30.—WEST PALM BEACH, FLA.
American Water Works Association—Florida Section. Annual meeting in conjunction with the University of Florida Short Course in Water Treatment. Secretary-Treasurer, Louva G. Lenert, Chief Engineer, State Board of Health, Jacksonville, Fla.

APRIL 2-4.—BIRMINGHAM, ALA. (200)
American Water Works Association—Southeastern Section. Annual meeting. Secretary-Treasurer, W. H. Weir, 4 Capitol Square, S. W., Atlanta, Ga.

APRIL 10-11.—SPRINGFIELD, ILL.
American Water Works Association—Illinois Section. Annual convention. Secretary-Treasurer, A. E. Skinner, Care The Pitometer Co., 5311 Kenmore Avenue, Chicago, Ill.

APRIL 11-12.—ATLANTIC CITY, N. J.
American Water Works Association—Four States Section. Annual meeting. Secretary pro-tem, Theodore V. Wood, 2600 Girard Trust Co. Building, Philadelphia, Pa.

APRIL 12-13—HELENA, MONT. (75)
American Water Works Association—Montana Section. Annual meeting. Secretary, Herbert B. Foote, State Board of Health, Helena, Mont.

APRIL 29—MAY 2.—WASHINGTON, D. C.
Chamber of Commerce of the United States. Annual meeting. Secretary, D. A. Skinner, 1615 H Street, N. W., Washington, D. C.

APRIL 29.—CAMBRIDGE, MASS. (100)
New England Sewage Works Association. Spring meeting. Secretary, F. W. Gilcreas, Room 409, 14 Beacon Street, Boston, Mass.

MAY 6-10.—CINCINNATI, OHIO.
American Water Works Association. Annual convention. (Hotel Netherland Plaza.) Secretary, Beekman C. Little, 29 West 39th Street, New York.

MAY 6-7.—BOSTON, MASS.
Massachusetts Safety Conference. Annual convention. (Hotel Statler.) Secretary, Lewis E. MacBrayne, 6 Beacon Street, Boston, Mass.

MAY 23, WEEK OF.—ATLANTA, GA.
National Fire Protection Association. Annual convention. (Atlanta Biltmore.) Managing Director, Franklin H. Wentworth, 60 Batterymarch Street, Boston, Mass.

MAY 16-18.—LEWISTON, IDAHO.
American Water Works Association—Pacific Northwest Section. Annual meeting. Secretary, Ernest C. Willard, 720 Corbett Building, Portland, Ore.

MAY 24-25.—POUGHKEEPSIE, N. Y.
New York State Sewage Works Association. Spring meeting. Secretary-Treasurer, A. S. Bedell, Albany, N. Y.

MAY 27-31.—INDIANAPOLIS, IND.
Building Officials' Conference. Annual convention. Secretary-Treasurer, William F. Hurd, Commissioner of Buildings, Indianapolis, Ind.

JUNE 17-21.—LOS ANGELES, CALIF.
Institute of Government. Sixth annual session. Executive Secretary, Walter E. Sykes, 3551 University Avenue, Los Angeles, Calif.

JUNE 23-30.—PRAGUE, CZECHOSLOVAKIA.
International Housing Association. Congress. General Secretary, Prof. Franz Schuster, Hansa-Allee 27, Frankfort a/M, Germany.

JUNE 24-29.—DENVER, COLO.
American Library Association. Annual conference. Secretary, Carl H. Milam, 520 North Michigan Avenue, Chicago, Ill.

JUNE 24-28.—DETROIT, MICH.
American Society for Testing Materials. Annual meeting. (Book-Cadillac Hotel.) Secretary-Treasurer, C. L. Warwick, 1315 Spruce Street, Philadelphia, Pa.

JUNE 24-29.—PARIS, FRANCE. (1,000)
International Chamber of Commerce. Biennial congress. Manager of the American Section, John P. Gregg, Connecticut Avenue and H Street N. W., Washington, D. C.

JUNE 25-27.—NEW BEDFORD, MASS.
New England Association of Fire Chiefs. Annual convention. (Hotel New Bedford.) Secretary-Treasurer, John W. O'Hearn, 99 Main Street, Watertown, Mass.

JULY, THIRD WEEK OF.—LONDON, ENGLAND.
International Federation for Housing and Town Planning. Congress. Organizing Secretary, H. Chapman, 25 Bedford Row, London, W. C. 1, England.

AUGUST 22-23.—PITTSBURGH, PA.
American Water Works Association—Central State Section. Annual convention. Secretary, H. L. Nelson, 2435 Koppers Building, Pittsburgh, Pa.

AUGUST 28-30.—PHILADELPHIA, PA.
National Shade Tree Conference. Annual convention. Secretary-Treasurer, Dr. R. P. White, New Jersey Agricultural Experiment Station, New Brunswick, N. J.

SEPTEMBER 19-20.—KENOSHA, WIS. (600)
League of Wisconsin Municipalities. Annual convention. Secretary, Frederick MacMillan, 114 North Carroll Street, Madison, Wis.

OCTOBER 14-17.—HOUSTON, TEXAS.
Southwest Water Works Association. Annual convention. Secretary-Treasurer, Lewis A. Quigley, Fort Worth, Texas.

OCTOBER 23-26.—SAN DIEGO, CALIF.
American Water Works Association—California Section. Annual convention. Secretary-Treasurer, J. E. Phillips, 207 South Broadway, Los Angeles, Calif.

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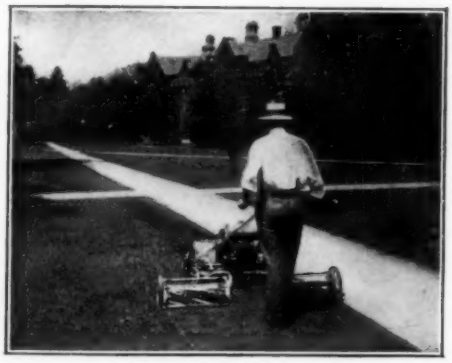
KENNETT SQUARE, PA.

SINCE 1867 COLDWELL



SUPER "L" TWIN WITH GANG ATTACHMENT

SUPER POWER!

COLDWELL Super "L-Twin" with sturdy gangs attached is an exceptionally powerful twin-cylinder power lawn mower and roller, combining complete flexibility with large cutting capacity. Three travel speeds.

Width of cut—25 inches to 94 inches.

Dependable performance. Extremely simple and economical to operate.

Sulky to ride, optional.

All Coldwell Power Lawn Mowers and Rollers, including the motors, are manufactured complete in the Coldwell plant.

The twin-cylinder motor and all parts are designed especially for the job where an abundance of power is required.

FULL PARTICULARS FURNISHED UPON REQUEST

COLDWELL LAWN MOWER CO., NEWBURGH, N. Y., U. S. A.
Manufacturers of Lawn Mowers—Hand, Horse, Gasoline, Electric

NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

High-Lift Centrifugal Pumps

Recent development of a specially designed pump for extremely high lifts or a high-pressure water supply has been announced in a bulletin issued by the Byron Jackson Co., Department 23, Berkeley, Calif. The pump, known as the Hydropress, embodies the proved principle of centrifugal pumps and permits the building of pressures up to 2,800 pounds. The number of stages ranges from 4 to 54, depending upon conditions. The pump capacity ranges from 10 to 250 gallons per minute. Four standard sizes are available, 8-, 10-, 12- and 15-inch. This type of pump is especially desirable for supplying water under high pressure for boosting purposes such as elevating water into reservoirs, also for fire protection, city park service, etc.

New District Manager for Infilco

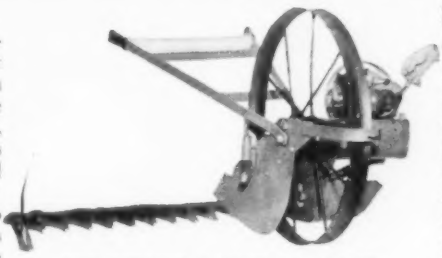
Wm. M. Gross has been appointed District Sales Manager in Ohio and eastern Michigan for the International Filter Co., 59 East Van Buren Street, Chicago, Ill. Mr. Gross will have his headquarters at The Westlake, Cleveland, Ohio. He was formerly Manager of the Water Treatment Division of the Graver Tank and Manufacturing Co.

Motorcycle Service Car Used by Police

Some time ago the Harley-Davidson Motor Co., Milwaukee, Wis., introduced a new type of three-wheeled vehicle called the Servi-Car, intended for use in picking up and delivering customers' cars to and from automotive service stations. Some of these three-wheelers found their way into light delivery work, which was not far removed from its original purpose. The Police Departments of Beaumont and San Antonio, Texas, Topeka, Kans., and Tulsa, Okla., have created an entirely new use for the Harley-Davidson Servi-Car for checking parked cars in restricted zones. The San Antonio unit shown in the accompanying illustration is operated by two men, one handling the controls and the other marking the tires of the parked cars by means of a long stick with a piece of chalk attached to the end.

The Rawls Scythe Becomes Detroit Motor Scythe

The manufacture and sale of the Rawls motor scythe has been taken over by the Detroit Harvester Co., Detroit, Mich., and it will henceforth be known as the Detroit motor scythe, according to C. A. Haefner, Sales Manager for the company. This scythe has a welded and riveted pressed steel frame that supports a sturdy, one-cylinder gasoline motor, which in turn propels a 36-inch sickle. The machine is mounted on a ball-bearing equipped with a 3-inch wheel having a farm type 3-inch concave tread. It is equipped with two handles that enable the operator to pivot the machine sharply in any desired direction or tilt the machine, which is built similar to a wheelbarrow, for cutting up or down slopes or for raising over obstructions.



THE DETROIT HARVESTER MOTOR SCYTHE

This scythe is applicable to all kinds of weed and grass mowing, enabling one operator to equal in results the work of four or more men with hand scythes. It can be readily operated on jobs that are impossible for larger cutting and mowing machines and is particularly adaptable for cutting grass and weeds in parkways, along sidewalks, and on undeveloped property where an uneven terrain often makes the use of horse-drawn mowers impractical.

Highway departments find the Detroit motor scythe invaluable for trimming shoulders and cutting in close places such as under guard-fences and around head walls of culverts and ditches. It is also used for trimming around hangars and buildings, and mowing the most used portions of landing fields on municipal airports, and for trimming around greens, fences, traps and bunkers of municipal golf courses.

New Railroad Warning Sign Also Helps Catch Criminals

An electrically controlled warning and highway barrier, operated by approaching trains and known as the Auto-Stop, has recently been brought out by the Evans Products Co., 2336 Union Guardian Building, Detroit, Mich. The Auto-Stop is built of structural steel and is designed to last a lifetime. It is a sane and certain solution of the railway crossing problem. The motor and other working parts operate only ten seconds for each train. It differs from every other grade crossing protector in that it gives a commanding warning for ten seconds before the actual barrier arises. Even the most careless driver is arrested by the glaring character of the warning directly in his line of vision. This device is supplemented with regulation roadside warning signs placed 800 and 400 feet from the crossing and is so designed as not to injure the motorist if contact is made at any reasonable speed. It does not require any maintenance except for occasional oiling and usual inspections by the signal department, and operates at a cost of less than $1.00 per month for electricity.

The Auto-Stop for a 20-foot roadway contains a bell, over 200 reflector buttons and 4 red flashers, all in the line of vision, and for wider roads a proportionate number. It may be operated by standard track circuits or manually, or with a double-track circuit to accommodate either slow or fast trains, thereby minimizing highway traffic delay.

This device can be readily wired for central or district police control to delay the escape of gunmen or other fugitives from justice via arterial highways, until pursuing police cars or motorcycles catch up to them.

A HARLEY-DAVIDSON SERVI-CAR USED BY THE POLICE DEPARTMENT OF SAN ANTONIO, TEXAS, FOR MARKING PARKED CARS IN THE BUSINESS DISTRICT

Many city, county and state highway departments have found the 300-gallon No. 78-OB Trail-O-Heater with Motor Spray Attachment to be the answer for low-cost maintenance. Other kettles in sizes from 10 to 1500 gallons.

There is

LITTLEFORD EQUIPMENT

for Large and Small Bituminous Road Jobs

The Littleford Model "M" Pressure Distributor—a low-cost outfit used to handle road oils, emulsions and cut-backs. Other models, made in sizes from 300 to 1500 gallons, handle all types of bituminous material.

Whether your highway jobs are large or small—patching or surface treating—you'll find the kind of equipment you need in the Littleford Line of Road Maintenance Equipment. It includes Pressure Distributors ranging in sizes from 300 to 1500 gallons . . . tar and asphalt kettles of all kinds and sizes . . . surface heaters . . . joint fillers . . . tool boxes . . . and a wide variety of paving tools and pouring pots. Select the outfit that will do your job right. Send for our complete catalog —you will be under no obligation.

LITTLEFORD BROS.
500 E. Pearl St., Cincinnati, Ohio

MUD-JACK METHOD

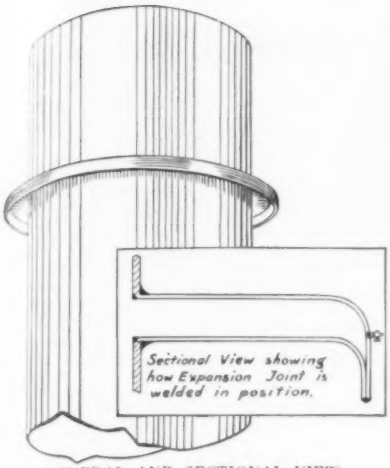
Corrects Sunken Street Slab—

as well as curb, gutter and walks. The No. 10 N. E. C. Mud-Jack raises sunken curb and gutter to the original or proper grade—and then raises the street slab to obtain a level surface. No replacement cost necessary—no street obstruction common to reconstruction activities—and above all, maintenance costs are reduced to a minimum.

Write for Mud-Jack Bulletin AC

KOEHRING COMPANY
Milwaukee Wisconsin

For Raising Concrete Curb, Gutter, Walks, Street



GENERAL AND SECTIONAL VIEW OF EXPANSION JOINT

Collar Expansion Joint on Milwaukee Air Duct

An ingenious method of taking care of expansion in a long pipe line has been used at the Milwaukee sewage disposal plant at Jones Island, Milwaukee, Wis., where flanged connections permit enough flexibility to prevent distortion of the pipe under longitudinal stresses.

This tube installation of Plykrome, a stainless clad steel, ranges from 2 to 5 feet in diameter. It was assembled in 54-foot lengths at the Island, where it was welded into a continuous tube 1,800 feet long. As the tube carries 100,000 cubic feet of air per minute under a pressure of 10 pounds per square inch, the joints were welded with particular care. The Cream City Boiler Co., contractors for the work, used Hansen welders made by the Harnischfeger Corporation, Milwaukee, Wis., in the fabrication and installation of the pipe.

The new type of expansion joint, made under patents held by the Allis-Chalmers Manufacturing Co., Milwaukee, Wis., was installed at intervals of 54 feet. The flange, or collar, protrudes from the outer edge of the pipe from 4½ to 6-5/16 inches, depending upon the diameter of the tube. As shown in the diagram, the pipe connections are separated by 1 inch of air space, amply allowing for expansion and contraction under wide temperature changes.

An Automatic Selector Sewage Pump Control

A control for sewage pumps which starts the proper pump in order to take care of the flow of sewage has been announced by the Minneapolis-Honeywell Regulator Co., Minneapolis, Minn. The control consists of a series of rotating cams driven by a sheave from which is hung a float, the movement of the float rotating the sheave. The cams, which are adjustable, tip mercury switches, making or breaking the pilot control circuits of the motor starters. By adjusting the position of the cams on the cam discs, the motors are stopped or started or speed changes effected according to the position of the float. It is thereby possible to operate any pump or any combinations of pumps, and to change speeds at any predetermined level or levels in the sump.

By means of this instrument all the operation of the various motors or speed changes is accomplished by a single instrument, eliminating the necessity of installing and synchronizing several pieces of equipment.

This machine will control simple sequence operations in which the first pump operates alone and then a second pump is added and a third or more are added in sequence, all of them being cut out together or in reverse order as desired. The next method is the programming operation, in which there are two or more pumps of different capacity which may be operated in single units or in combination about equal to the varying inflow of sewage into the sump. The third method of operation is by changing motor speeds, which more closely synchronizes with the actual flow of sewage.

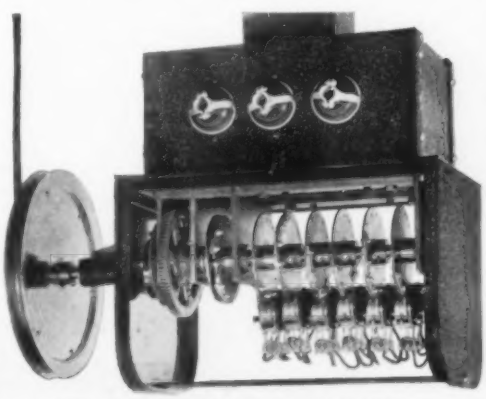
H. W. Sweatt, for the last eight years Vice-President and General Manager of Minneapolis-Honeywell Regulator Co., has been made President of the company succeeding M. C. Honeywell, who has served as President since the merger of the Minneapolis Heat Regulator Company and the Honeywell Heating Specialties Company in 1927. Mr. Honeywell becomes Chairman of the Executive Committee.

Worthington Regional Office

The Worthington Company, Inc., Harrison, N. J., has recently established Pacific Coast regional headquarters at 510 West 6th Street, Los Angeles, Calif., with C. E. Wilson, Vice-President, in charge. This new regional office will have jurisdiction over the district offices in Seattle, San Francisco, Los Angeles, and El Paso.

McCloskey Elected Vice-President

At their late December meeting the Directors of Blaw-Knox Co., Pittsburgh, Pa., elected Robert F. McCloskey, Director and Vice-President in charge of operation of the plants located at Blawnox, Pa., to replace Wayne Rawley, deceased. Mr. McCloskey was previously General Superintendent of the company's Blawnox shops. He has been associated with the company since 1920, starting as manager of a plant then located at Wheatland, Pa. In 1922, he was made Production Manager of shops at Blawnox, and in 1931, became General Superintendent.



THE FLOAT-ACTUATED CONTROLLER

Western Gas Consolidates with Koppers

The business of the Western Gas Construction Co., of Fort Wayne, Ind., has been consolidated with that of its parent company, the Koppers Construction Co., of Pittsburgh, Pa. The activities formerly carried on in the name of the Western Gas Construction Co. will hereafter be carried on under the name of the Western Gas Construction Division of the Koppers Construction Co.

The company began operations in 1888 as designers and builders of valves and other equipment for utility fields. At the time the Koppers interests assumed control of the Western Gas Construction Co., in 1917, the buildings, including the machine shop, plate and structural shop, foundry, pattern shop, offices and other buildings, covered an area of 13 acres. The volume of business expanded steadily and in 1926 the company found it necessary to purchase an additional plant site of approximately 30 acres, upon which was erected a new machine shop, plate and structural shop and an office building. The modern facilities and equipment of the new plant have enabled the company to materially increase the scope of its activities.

The consolidation, which was effective January 1, 1935, does not involve any change in physical operations or activities which will continue to be centered in Fort Wayne, Ind.

Pittsburgh Equitable Opens Memphis Office

The Pittsburgh Equitable Meter Co., Pittsburgh, Pa., has announced the opening of a new district office at 67 McCall Street, Memphis, Tenn. Z. A. Stanfield, who has represented the company for many years in a sales capacity, has been appointed District Manager of this new territory and will have associated with him J. H. Ferguson and other representatives yet to be announced.

The Memphis office will serve the territory comprising the states of Alabama, Mississippi, Kentucky, Tennessee, and portions of Louisiana, Georgia and Florida. District headquarters for both the Pittsburgh Equitable Meter Co. and its subsidiary, the Merco Nordstrom Valve Co., will be maintained in Memphis.

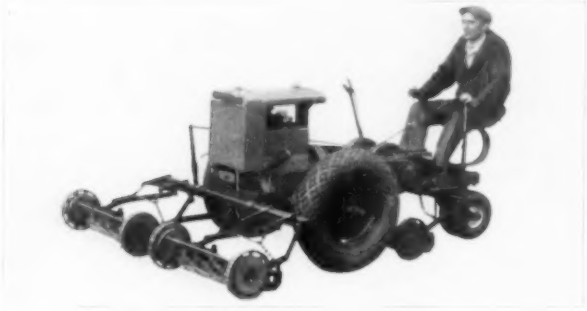
Water Rates

All reports published in THE AMERICAN CITY and THE MUNICIPAL INDEX in 1934, for a total of 237 cities, have been reprinted in a 64-page, 8½ x 11-inch pamphlet.

Price One Dollar

UNSURPASSED for Park Work

With these Ideal models—park systems in—Los Angeles, Rockford, Springfield, Chicago, Indianapolis, Evansville, Lexington, Charleston, Hamilton, Toronto, Buffalo, Albany, New York, Washington, Boston—have found real economy.



IDEAL POWER TRIPLEX

Big capacity mower, outperforming any other. Power steered, handling is easy, the Triplex gets in and out of tight corners where no other big mower can operate. Rubber tires permit transportation over pavements. Cutting units lift off the ground. Cutters operate in front of wheels, insuring a clean job and always in view of the operator.

IDEAL MASTER "THIRTY"

Roller type, its rugged construction, simplicity and long life make the Ideal "thirty" the park favorite.

For rough ground or the smoothest sod, the "thirty" does a completely satisfactory job. This mower can stand more hard work and rough treatment than any on the market—and that means economy.

For 1935—greater refinements and improvements are offered. Write for details.

IDEAL

POWER LAWN MOWER COMPANY

400 Kalamazoo Street Lansing, Michigan

Branches

161 Vester Street, Ferndale (Detroit) Michigan
237 Lafayette Street, New York City

Canadian Distributors: Aikenhead Hardware, Ltd., 17 Temperance Street, Toronto, Ont.

In direct line of vision but never in the way—

The MASTER TRAFFIC SIGNAL

Ever hear of accidents with those big traffic signs stuck square in the middle of the street?—Of course you have!

The MASTER traffic signal is also right out in front, where the signal should be, yet it is perfectly safe—never an obstruction to traffic, because when run over, it lies down flat to the pavement, springing back into position after the car has passed by.

Illustrated printed matter and prices sent on request. We have an interesting proposition for sales representation.

The picture shows the signal after it has been run over—after it has flipped back into position ready to warn the next comers.

SAGINAW-CORNELL TRACTOR CO.

Sole Distributors
Water and Bristol Streets
Saginaw, Mich.

Complete assortment of general line of nursery products. Also large specimens of shade and ornamental trees and shrubs.

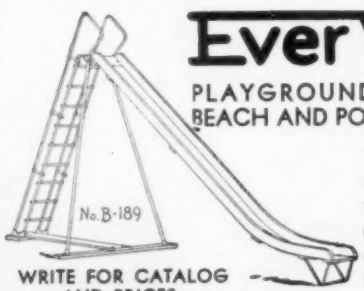
BIG TREES MOVED AND GUARANTEED

Consultations and Inquiries Invited

THE GREENING NURSERY CO.

MONROE - - - - MICHIGAN

Born 1850 - - - - - *Still Growing*



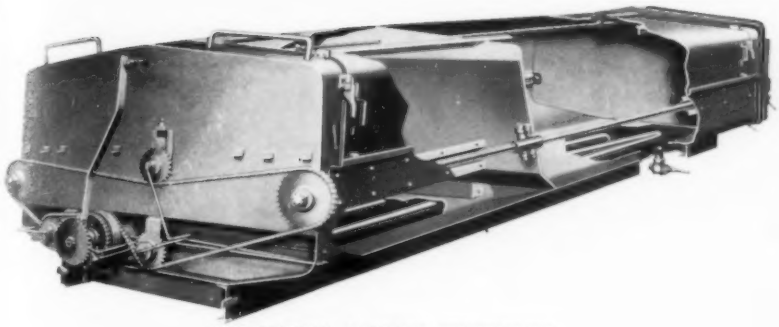
EverWear

PLAYGROUND APPARATUS
BEACH AND POOL EQUIPMENT

The standard of safety, the world over. A complete line of approved apparatus.

WRITE FOR CATALOG AND PRICES

The EverWear Manufacturing Co.
SPRINGFIELD, OHIO



THE MARION GARBAGE COMPRESSOR

New Garbage Collection Unit

A refuse compressor body designed especially to handle garbage and refuse in a sanitary and economical manner, has been announced by the Marion Steel Body Co., Marion, Ohio. The Marion refuse compressor is a fully enclosed steel body with all openings rubber sealed, making it odor- and water-proof. A simple device compresses the load, removing the fluid content, permitting much greater capacity than otherwise would be possible. The average garbage contains a large amount of fluid, which is removed in the Marion unit by compressing the refuse and letting the fluid flow into a 110-gallon tank located below the body.

A standard S.A.E. power take-off furnishes the motive power for sprockets which in turn engage two clutch discs for forward or reverse operation of the compressor plate, all controlled by a lever in the driver's compartment. Two continuous screws set in tapered roller bearings running the entire length of the compressor actuate the plate by revolving through phosphor-bronze nuts which are integral with the plate. An automatic stop prevents the plate from moving too far forward or backwards. The removable plate is pierced allowing liquids to drain into the sump tank beneath. Liquid is discharged through a 4-inch special valve in the rear of the chassis, which is heated in winter by a bank of coils connected to the motor exhaust.

To unload the truck, the plate is merely moved to the extreme rear after the watertight end-gate has been tripped. Due to this method of discharging the load no hoist is required and a much lower loading height is possible.

The body is 66 inches wide, 40 inches high, 120 inches long, and weighs 1½ tons. It has a capacity of 6 yards of compressed material equal to about 12 to 15 yards of loose refuse, weighing approximately 5 tons. It may be mounted on any 1½-, 2-, or 2½-ton truck with a wheelbase of approximately 175 inches. The average loading height is 53 inches.

A New Semi-Dwarf Hedge Plant

The Truehedge Columnberry is a new semi-dwarf hedge plant with upright stalks, having the hardiness, the autumnal coloring, the bright red berries, and the protective thorn of the Japanese barberry. This new hedge plant was discovered by M. H. Horvath, who retired from active landscape activities in 1918 to devote his entire time to the development of new worth-while plants. During his work on a large estate in the eastern section of the United States, he discovered one day a form of Berberis Thunbergi pluriflora with a strong tendency toward erect growth. He picked the seed from this plant and from the seedlings grown selected the most upright types, from which he again picked the seed. This process was repeated until the fifth generation, wherein Mr. Horvath found the perfect, spire-like plant which he was seeking and which is now being propagated and sold as Truehedge Columnberry, by the Cole Nursery Co., Painesville, Ohio.

Metal Folding Chairs

Metal folding chairs built with a style for every portable seating purpose are made by The Stewart Iron Works Co., 110 Stewart Block, Cincinnati, Ohio. They are built of specially formed steel channels with but three moving parts. A full size seat with a correctly pitched form fitting back assures comfort. The construction renders the chair tip-proof and the absence of exposed hinges and sharp projections eliminates injuries or damage to clothing. The chairs may be opened or closed quietly with one operation and they are equipped with rubber tips for silence and for floor protection. They require only 1¾-inch per chair for storage space.

The chairs are 15¼ inches wide, the seat is 13 inches deep and the height from the floor to the top of the seat in front is 17 inches, the height when open 31 inches, when folded 36 inches. The accompanying illustration shows a typical installation of Stewart folding chairs, which offer a solution of the seating problem in schools, churches, gyms and all public gathering places.

New Publicity Manager for U. S. Pipe & Foundry Co.

The United States Pipe and Foundry Co., Burlington, N. J., has announced the appointment of Ralph M. Shaw, Jr., as Publicity Manager for the company with headquarters at Burlington, N. J., succeeding S. E. Linderman. Mr. Linderman has been appointed Washington Representative.

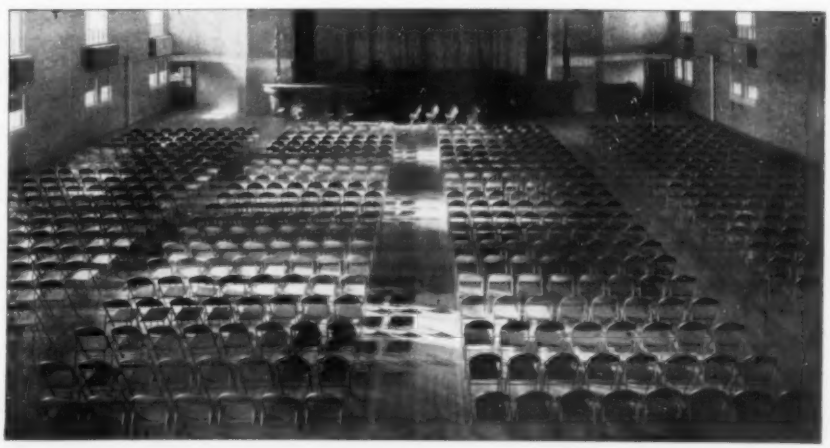
Bixby Now with Pittsburgh Equitable

The Pittsburgh Equitable Meter Co., 400 Lexington Avenue, Pittsburgh, Pa., has announced that E. W. Bixby has joined the organization in a sales capacity. He will be attached to the recently opened office at 67 McCall Street, Memphis, Tenn. He received his early waterworks training under his father, the late L. H. Bixby, who was Superintendent of the City Water Co. in Chattanooga. In 1924, he joined the Columbian Iron Works in the Sales Department, becoming Sales Manager four years later.

Mr. Bixby, who is widely known and highly regarded in the municipal and water-works fields, will contact the trade in Chattanooga and other towns in Tennessee as well as in Kentucky, representing both the Pittsburgh Equitable Meter Co. and its subsidiary organization, the Merco Nordstrom Valve Co.

Knox Enters Private Consulting Practice

Stuart K. Knox has announced his retirement after many years as co-partner in the firm of Nicholas S. Hill, Jr. He will engage in private practice in hydraulic and sanitary engineering at 25 Warfield Street, Montclair, N. J., and 11 Broadway, New York.



METAL FOLDING CHAIRS QUICKLY CONVERT A GYMNASIUM INTO AN AUDITORIUM

30-inch Mono-Cast Doublex Simplex Pipe being installed for outfall sewer line discharging into San Pedro Bay from Terminal Island, near Los Angeles, Calif. For literature on this pipe, write American Cast Iron Pipe Co., Birmingham, Ala.

Look Here...Three Times This Week You Let That Tank Run Over

Engineer Smith is a stickler for efficiency. Just now he is reading the riot act and there isn't a chance for an alibi when he has that SPARLING RATE - OF - FLOW chart in his hand. It stands for accurate recording. Month by month more water superintendents are installing SPARLINGS and gaining in plant efficiency thereby.

There is a SPARLING Meter and Recording equipment that will fit YOUR requirements. Ask for Bulletin 302-A, or submit your problem direct to our engineers.

R. W. SPARLING

NEW YORK 101 Park Ave. | CHICAGO 3104 S. Michigan | LOS ANGELES 945 N. Main St.

Pierce Power Rollers
for Street and Park Maintenance

Cities all over the United States and Canada are using Pierce Rollers for light construction work and for maintenance of streets and alleys. These Rollers are also ideal for leveling drives in parks and for rolling park lawns. They offer the most practical means of keeping tennis courts, playgrounds, race tracks, athletic fields and airports in proper condition.

Built in three serviceable models: ¾, 1½-2, and 3-ton. You save money when you buy Pierce Rollers. Write for information.

The Pierce Governor Company
Anderson, Indiana

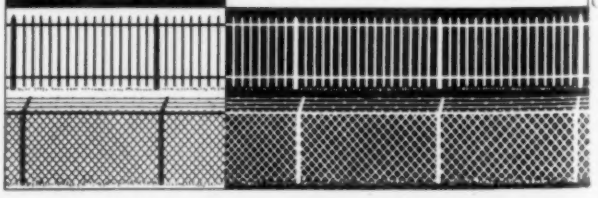
EVERYTHING IN SEWER CLEANING EQUIPMENT

WRITE FOR CATALOG

TURBINE SEWER MACHINE CO.
52nd and W. State Streets MILWAUKEE, WIS.

FENCE for every PUBLIC PROPERTY need

Stewart FENCES
IRON AND CHAINLINK WIRE
New Catalog sent upon request
The Stewart Iron Works Company, Inc.
110 Stewart Block Cincinnati, Ohio



Why not remember to mention THE AMERICAN CITY?

Snow-Plowing and Chip-Spreading on Delaware River Bridge

Day and night traffic in winter over the Delaware River Bridge connecting Philadelphia, Pa., and Camden, N. J., must be kept moving. The Delaware River Joint Commission operating the bridge uses a Model BF Mack truck with a Good Roads Champion Model 32-A one-way blade snow-plow equipped with a hand-hydraulic lift for this purpose. Although of the one-way type, the blades have adjustment for varying the tilting and plowing angles, since the exclusive Good Roads automatic safety blade trip allows operation at high speed with safety.

THE OUTFIT USED ON THE DELAWARE RIVER BRIDGE

These features are embodied in all Good Roads blade plows of both the reversible and one-way types made by the Good Roads Machinery Corporation, Kennett Square, Pa. Large-diameter, spring-mounted, roller-bearing, full-swiveling castor wheels support the plow, minimizing the load on the truck and conserving the motive power for the work of snow removal. The wider arc of the strongly trussed semi-circles distributes the thrust evenly over the entire length of the moldboard through four hinged connections. The push frame connection to the moldboard is through a swiveling push bar arrangement permitting free oscillation of the plow to suit the contour of the highway.

To the rear of the Delaware River Bridge truck is attached a Good Roads sand and cinder spreader for effectively distributing materials quickly and in controlled quantities over the surface of the roadway if it tends to become slippery. These spreaders are strong and durable, but of minimum weight, and are easily handled. They are mounted on steel rubber-tired wheels. This combination of plow and spreader is always ready to combat ice and snow conditions. During periods of clear weather both units are detached and the truck is used for other service. Upon the approach of a storm, either the plow or the spreader or both can be attached within a few minutes and the truck loaded with material for spreading.

Gohi President Re-elected

Gohi Culvert Mfrs., Inc., at its recent Cincinnati, Ohio, meeting, re-elected E. B. Abbett as President. He is also President of the National Corrugated Rolled Metal Culvert Pipe Association and Chairman of the Code Authority for that industry.

This is Mr. Abbett's sixth term as President of Gohi Culvert Mfrs., Inc., and his second term as President of the National Corrugated Rolled Metal Culvert Pipe Association. He has been General Manager of the Newport Culvert Co., Newport, Ky., since 1927.

Prominent Water-Works Man Dies

Burt B. Hodgman, known throughout the United States as Vice-President and Chief Engineer, National Water Main Cleaning Co., 50 Church Street, New York, and as Chairman of the Entertainment Committee of the American Water Works Association, died in New York City January 20, 1935. "Burt," as he was known throughout the waterworks fraternity, was a native of Coldwater, Mich., and a graduate of Princeton. Before joining the National Water Main Cleaning Co. he was with the Pitometer Co., and in 1907 was assistant engineer in charge of distribution of filtered water for Philadelphia, Pa.

A Crankless Diesel

The Sterling crankless diesel engine is being built in various sizes up to 500 horsepower at 1,200 rpm. These engines occupy less space than the crankshaft type of diesel and owing to the design characteristics are rated for continuous duty at higher speeds. The intermediate sizes may be used at 1,900 rpm continuous 24-hour service, the smaller sizes at 1,200 rpm. These new diesels are being produced by the Sterling Engine Co., 1252 Niagara Street, Buffalo, N. Y.

These are opposed piston engines, the pistons working in horizontal cylinders. The outboard ends of the pistons are closed off and fastened to a yoke arrangement, in which are mounted two ball-and-socket type thrust bearings. Two flywheels are mounted on the engine, one at each end. These flywheels are not at right angles with the shaft, but are mounted at a slight angle, and are referred to as "inclined discs." The combustion pressure is applied through the ball-and-socket thrust bearings, against the face of the inclined disc. The pressure against the angle of the disc causes the disc to move. The pressure is held by the mounting of the thrust bearings so that it is exerted against the flywheel and cannot be dissipated in any other way. The net result is smooth operation, which is not experimental, since this type of thrust bearing is being used extensively in hydraulic turbines and other machinery.

Soldered Fittings Not Damaged When Thawed by Electricity

There has been much discussion of possible damage to service pipes by thawing with electricity. The Mueller Brass Co., Port Huron, Mich., reports that there is no damage to Streamline soldered fittings for copper pipes when services are thawed by electricity. A report states: "The solder would not be melted in the thin section of a Streamline fitting, because the heat would be dissipated fast enough to be taken up by the ice, whereas in the thicker section of the iron pipe sufficient heat might be retained at the start of the operation to melt the lead. The solder in the Streamline patented joint is drawn in by capillarity, and even if the solder were to become liquid by heat, it would still be held in by the same force that originally drew it between the bonding surfaces."

Two experiments were recently performed to determine the effect of heat on Streamline copper pipe fittings. In one, a line containing water was run through a pile of packing boxes which were set afire. No damage was done to the pipe or fittings, because the boiling point of the water was lower than the melting point of the solder and the heat was taken up by the water. In the second experiment, the water was drained from the line and the solder melted in the joints in the fire, but capillarity held it in place and as soon as water was turned on again, the solder solidified and not a single leak occurred, according to the report.

Besselievre Visiting South America

Edmund B. Besselievre, Manager of the Eastern Territory of the Sanitary Engineering Division of The Dorr Co., Inc., 247 Park Avenue, New York, sailed January 26, 1935, for a year's visit to South America, during which he will visit practically all the South American countries to discuss with engineers and officials the application of modern methods of sewage, water and trade waste treatment.

Portable Safety Road Signals

New portable signals for marking obstructions and detours and temporary caution or danger points, designed for use by state and county highway departments, city street commissioners, police departments, road contractors, electric railways, building contractors, water departments, fire departments and industrial plants have been brought out by The Martindale Electric Co., 1368 Hird Avenue, Cleveland, Ohio. These signals open and close automatically with one hand, and only a few seconds is required to set up the signal and snap on the sign. They are of simple construction, simple to operate, strong and durable, small and compact when folded, easily and quickly erected, effective in use, and without springs, catches or bolts, and have nothing to adjust or get out of order.

THE MARTINDALE SIGNAL SET UP FOR USE

A STURDY COMPACT ONE-MAN ONE-TRIP SIGNAL

New Portable Signals
for Marking
Obstructions and Detours

Opens and closes automatically with one hand.

Only 17 seconds required to walk (not run) 10 yards, set up the signal, snap on the sign, remove the sign, close the signal and walk back to the starting point.

Stock Signs for Fire, Water, Police, and Street Departments, Surveyors, Road Contractors, etc.

Write for Bulletin No. 322

THE MARTINDALE ELECTRIC CO.
1368 Hird Avenue Cleveland, Ohio

Everything BULLARD in Safety

BULLARD

Five-horsepower horizontal siren for signalling fire calls in a volunteer district. Note parabolic deflector which regulates direction of signal; also tapered stator. Write for catalog.

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PITTSBURGH Safety First Supply Co. - Brady Building
PHILADELPHIA J. A. Hunt Co. - 2036 Sansome St.
CLEVELAND Safety Clothing Co. - 3804 Payne Ave.
BRAINTREE, MASS. Direct Sales Co., 308 President Road

SOUTH CHATTANOOGA, TENN. C. D. Genter Company, Chattanooga Bank Building

MID-WEST DETROIT C. H. Dickson Company - 2885 East Grand Boulevard
CHICAGO E. D. Bullard Company - 215 South Leavitt Street
GREEN BAY, WIS. Safety Service Company - 108 No. Quincy Street
DULUTH W. P. & R. S. Mars Company - 324 W. Michigan Street
HOUSTON E. D. Bullard Company - 1 Main Street

WEST SAN FRANCISCO E. D. Bullard Company - 275 Eighth Street
LOS ANGELES E. D. Bullard Company - 1229 South Olive Street
SALT LAKE CITY E. D. Bullard Company - 1420 Yalecrest Avenue

GENERAL ILLUMINATION ENGINEERING CO.

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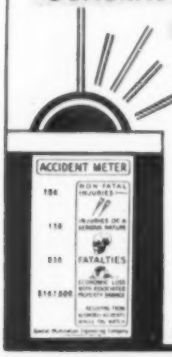
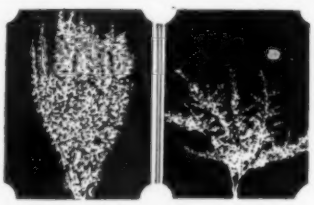


NEEDLESS—

Over half of the night automobile accidents on city streets are needless. Yet they continue to increase the taxpayers' burden and consequently are one cause of delinquent taxes — all for want of a little additional street lighting. If your city's accident toll is increasing, rather than decreasing, may we refer you to our advertisement in the new 1935 Municipal Index where you can see how easy and economical it is to eliminate needless accident losses. General Illumination Engineering Company, Cincinnati, Ohio.

LIGHTING EXPERTS SELLING NOTHING BUT SERVICE



Average 2 year old TRUE HEDGE plant without trimming

Average 2 year old Common Barberry plant without trimming

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Introducers of

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U. S. Plant Patent No. 110

GROWERS ON 700 ACRES

Ornamental Shade trees, shrubs, evergreens, perennials, roses, fruits. In fact

"EVERYTHING THAT'S GOOD AND HARDY"

Price List on Request

PAINESVILLE OHIO

WHEN you may have Columnberry Hedging

WHY consider old-time Barberry

Practically no trimming necessary. Saves you 2 to 3 years work and waiting for hedge effect. Truehedge is cheaper in the long run, superior in beauty, has better foliage, is perfectly hardy, drought resisting and rust immune.

"HVASS"
SPREADERS
Conquer Slippery Pavements

Spread full width street or road at one time or any part thereof.

—SPREAD—
SAND, ASHES OR CINDERS

Can be quickly attached or detached.

Write for descriptive bulletin.

CHAS. HVASS & CO., Inc. 508 East 19th Street, New York City

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Night Time's the Right Time for Accidents

By **ARNOLD H. VEY**
Traffic Engineer, State of New Jersey

IN the face of all the publicity given the facts about night accidents, many officials and many more motorists believe that highway lighting to bring about better seeing conditions is extravagant, that the driver is responsible for most accidents and that these will happen regardless of up-to-date facilities.

Such erroneous opinions are formed by experience with "just" lights and not modern highway lighting, which combines efficient redirecting equipment with mounting heights of 22 to 28 feet, as well as placing the luminaire over the traveled portion of the highway. Other considerations are size of lamp and luminaire with respect to type, volume, speed of vehicles, as well as the type and character of road topography and conditions immediately adjacent to the road.

In New Jersey in 1933 the 33,803 accidents caused 1,185 deaths and more than 28,000 injuries. Of these accidents, 44 per cent of the total and 55 per cent of the deaths occurred at night when traffic was 20 per cent of the 24-hour total. The National Safety Council states that in this year 58 per cent of all fatal motor accidents occurred during dusk or darkness. Therefore New Jersey's experience parallels that of the entire country.

14th AVE., DETROIT, UNDER MAZDAS; BELOW, WITH MERCURY VAPOR

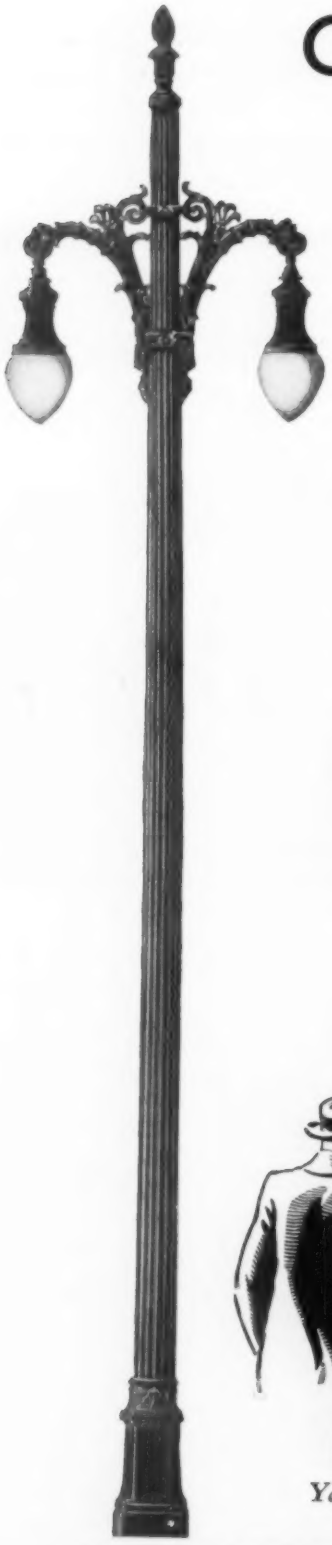
On the heavily traveled Routes 25 and 26 from the Newark airport to the Trenton traffic circle, 50.6 per cent of the 1,102 accidents occurred at night. A comparison of day and night accidents, by types, on a lighted and an unlighted stretch of this highway was made. The lighted stretch is a continuation of the unlighted stretch on Route 25 from the Holland Tunnel entrance to the Newark airport and is lighted in accord with the recommendations of illuminating engineers.

Along the unlighted stretch, it was found that accidents which occurred during times of more or less congestion upon the highway, such as right-angle collisions, collisions between vehicles going in opposite directions—where one vehicle was making a left turn—and miscellaneous accidents, were more prevalent during hours of daylight, but that collisions which might have occurred because of insufficient visibility, such as rear-end collisions, head-on collisions and pedestrian accidents, occurred more frequently during hours of darkness. In percentage, it was found that for these three latter types of accidents, there was an increase of night over day accidents equaling 8 per cent, 19 per cent and 72 per cent, respectively.

Along the lighted stretch of highway, however, accidents of all types, with the exception of fixed-object collisions, occurred more frequently during hours of daylight, ranging from 27 per cent to 80 per cent.

When considering accidents of all

Voters judge your administration by the good it does



Cheerful Streets Help Build Business

In Terre Haute People Like to Buy on Bright, Attractive Streets

Recently, Terre Haute, Ind., modernized (with G-E equipment) the street lighting of its entire business district. There, as in so many other cities, the merchants know that the first step in building business is to present an attractive, successful appearance. Modern street lighting is essential — it is an advertisement to both local and rural customers, because people prefer to shop on well-lighted streets. • An administration that improves the community wins the respect and loyal support of its citizens. Lighting will bring improvements — improvements that you can point to with pride. Good street lighting promotes business; it encourages building; it increases property values and indirectly increases income from taxes. • General Electric engineers have had long experience with street-lighting problems. Let them discuss with you the proper equipment to give economical, adequate lighting. Write to General Electric, Dept. 6A-201, Schenectady, N.Y., for any information on Novalux street-lighting equipment.

You pay for good street lighting whether you have it or not

500-124

GENERAL ELECTRIC

types, it was found that along the unlighted stretch, there was an increase of 2.5 per cent of night accidents over day accidents, while along the lighted stretch there was a decrease of 43 per cent.

The lighted section of State Highway Route 25 requires an expenditure of $23,691 per year. If it is assumed that adequate lighting had not been provided along this portion of highway and that, therefore, the excess in night accidents would be comparable to the average excess of the dark portions of Route 26 and, using a figure of $1,000 as the economic loss for each accident, it is found that there would have been a loss of $78,000.

It is considered that such an analysis is entirely fair as, in all probability, if lighting had not been provided along the lighted portion of Route 25, there would have been a greater excess of night accidents over day accidents, because of the fact that there is a greater concentration of night traffic on this section of Route 25 than on the sections of Route 26 used. Also, the economic loss of $1,000 per accident is considered a conservative figure.

If the previous analysis is reversed, and it is assumed that the dark sections of Route 26 were adequately lighted and, consequently, the excess in night accidents over day accidents decreased comparably to the ratio for the lighted section of Route 25, it is found that there would have been an economic saving of nearly $40,000 after deducting the cost of lighting. This saving is based upon an economic loss due to motor-vehicle accidents of $1,000 per accident and a cost of $1,500 per mile of highway to adequately light the portions of Route 26 indicated.

The difference of approximately $4,000 per mile for the cost of lighting the unlighted stretch and that of the lighted stretch is explained by the difference in lighting requirements along the lighted stretch due to type of roadway and density of traffic.

There is a definite relationship between highway lighting and highway accidents and in general, where highway lighting is adequately provided, there is a substantial reduction in night accidents. This reduction in night accidents results in an economic saving in all cases in excess of the cost of providing street lighting, not mentioning, of course, the suffering and sorrow which inevitably accompany motor-vehicle accidents.

Sufficient and proper illumination for night driving can be attained by properly used headlights and up-to-date street and highway lighting. The science of automobile headlighting is improving and with the newly adopted multiple-beam headlights, it is possible, under favorable conditions, to provide illumination far enough in advance in order to give drivers adequate vision for safety at high rates of speed. However, because of the volume of traffic normally using major highways, such headlight illumination makes it necessary that the clear road beam be frequently depressed so as not to cause excessive glare to opposing drivers. Oftentimes, because of negligence or carelessness, drivers fail to depress the clear road beam and, consequently, create a momentary blinding of drivers approaching from the opposite direction.

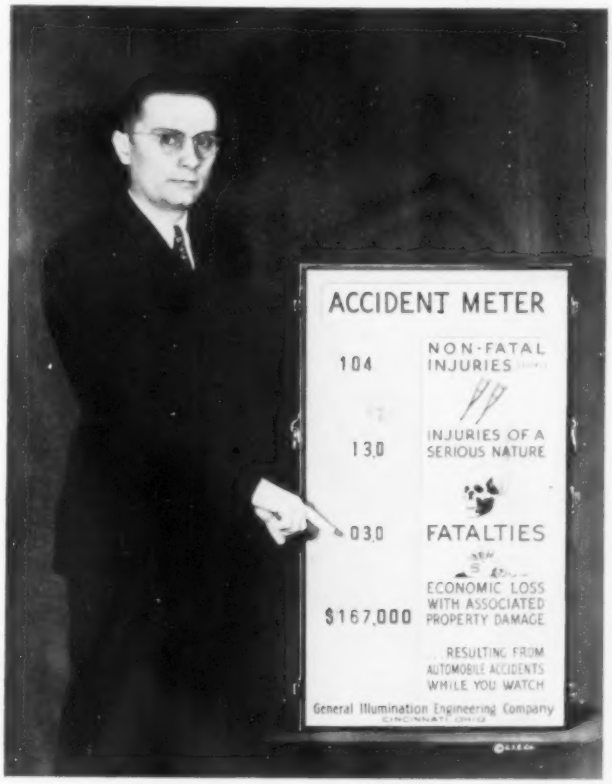
With highway lighting, the principle of vision by silhouette is employed so that beam candlepowers necessary for headlights need not be used. In addition, the light source may be placed high enough from the roadway to be out of direct line of vision of drivers. It may be placed over the travelable portion of the roadway, providing a continuous path of light even in times of inclement weather. Also, maintenance of a street-lighting system is in the hands of but a few trained men as compared with the maintenance of individual lighting systems on hundreds of thousands of automobiles.

It is true that proper and sufficient highway lighting appears costly. However, the expense of properly lighted highways compared with the benefits derived, including saving of lives and saving of millions of dollars, all of which is a part of the tremendous economic loss, shows a saving of monies to the taxpayer, who must ultimately foot the bill in either case.

From an address before the Highway Research Board, Washington, Dec. 6, 1934.

Four Deaths Per Hour on the Road

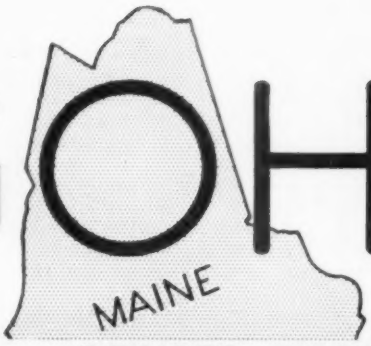
THE Accident Meter was developed by the General Illuminating Engineering Co. as a graphic means of registering motor-vehicle accidents at the average rate at which they happen day and night. Its demonstration by Paul H. Goodell, Consulting Engineer of the Company, at the Baltimore Convention of the Illuminating Society in October, created a great deal of interest. Here Mr. Goodell is shown pointing to the three deaths that occur, on the average, every 45 minutes. During this short period there have been 104 non-fatal injuries, 13 of which were serious. An improved quality of street and highway lighting is the permanent remedy proposed for checking this rising accident rate.



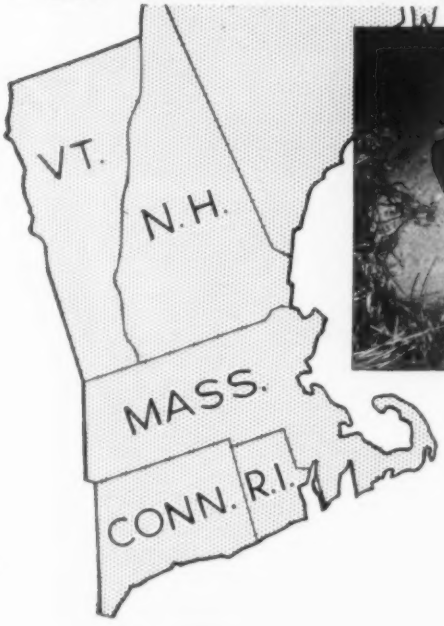
In San Antonio, Texas

THE San Antonio Chamber of Commerce has asked for considerably more lighting. Appropriations have been reduced from $143,000 in 1930 to $100,000 in 1931, to $57,000 in 1932, and were $58,800 in each of the last two years. Many people believe that citizens pay for adequate street lighting whether they have it or not.

GOHI



. . . in the NEW ENGLAND STATES . . .



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PURE IRON - COPPER ALLOY

Meets copper-bearing pure iron requirements in all accepted specifications for corrugated metal culverts.

THE use of GOHI Corrugated Pipe is universal because GOHI successfully meets every demand of a drainage structure over the longest period of time.

In New England installations, as in all other parts of the country where severe weather conditions test any drainage structure, culverts made from GOHI Pure Iron-Copper Alloy provide the maximum resistance against the action of wear, weather and corrosion, the crushing weight of shifting and settling fills, alternate freezing and thawing, the destructive pounding of heavy traffic.

Culverts made from GOHI Corrugated Pipe are free from costly repairs and replacements. They normally outlast the roads under which they are laid.

The fabricator nearest you will be glad to give you all the facts. Consult him freely, without obligation.

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The American City

The Elevated Storage Tank at Tallahassee, Florida

See page 51